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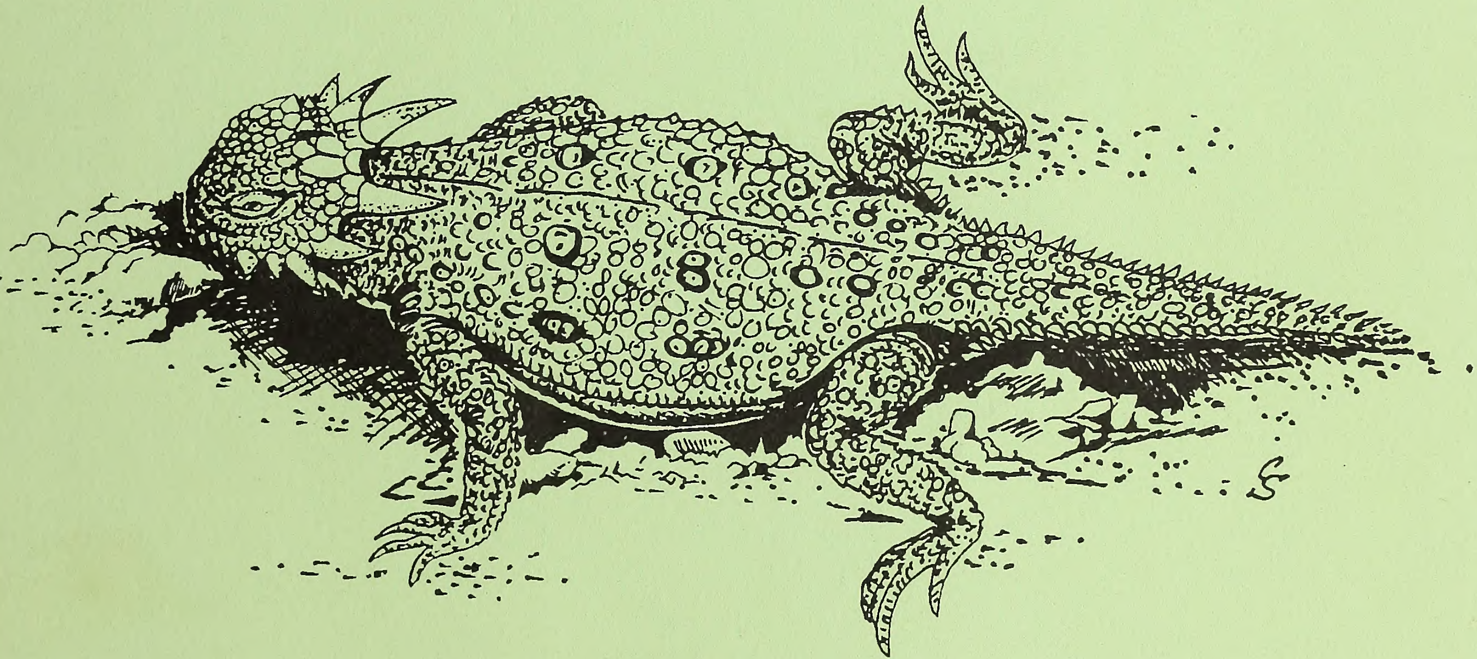
MANAGEMENT PLAN



Bureau of Land Management
California Desert District
El Centro Resource Area

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March 3, 1849

Management Strategy for the Flat-tailed Horned Lizard (*Phrynosoma mcallii*) on Bureau of Land Management Administered Lands within the California Desert Conservation Area

Submitted To:

Area Manager
El Centro Resource Area
California Desert District
Bureau of Land Management

and,

Regional Manager
Region 5
California Department
of Fish and Game

U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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U. S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

MANAGEMENT STRATEGY FOR THE FLAT-TAILED HORNED LIZARD

Management Strategy for the Flat-tailed Horned Lizard (Phrynosoma mcallii) *on Bureau of Land Management Administered Lands within the California Desert Conservation Area* was developed and will be implemented under the authority of the Sikes Act (PL 93-452).

U.S Department of the Interior Bureau of Land Management California Desert District	State of California The Resource Agency Department of Fish and Game
Gerald E.	Fred A Worthley
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1/10/90	12/20/89
Date	Date

I. INTRODUCTION

The flat-tailed horned lizard (*Phrynosoma mcallii*) has been a species of increasing concern to State and Federal management agencies in California since the late 1970s. This increasing management profile has been due to observed declines in much of the species' range. This concern has accelerated in the last year, during which the species has become a candidate for State listing as threatened and endangered as well as being elevated by Region 1 of the U.S. Fish and Wildlife Service to Category 1 candidacy for inclusion on the Endangered Species List (54 FR 559, January 6, 1989).

Although local management plans have been prepared for two of the four crucial habitat areas defined by Turner and Medica (1982), the species' declining status has made apparent the need for a species management plan which defines survey, management, and mitigation strategies. The Bureau of Land Management, in coordination with the California Department of Fish and Game and the U.S. Fish and Wildlife Service, has therefore prepared the present document, which codifies a uniform approach to mitigation and compensation. This will permit more effective management of habitat and more efficient processing of land use proposals within the Bureau's multiple-use, sustained yield mandate.

II. STATUS

A. Official Status

1. Federal Status

The flat-tailed horned lizard (*Phrynosoma mcallii*) inhabits desert areas of southern Riverside, eastern San Diego, and Imperial Counties in California; southwestern Arizona; and adjacent regions of northwestern Sonora and northeastern Baja California Norte, Mexico (Rado, n.d.; Turner and Medica, 1982) (Figure 1[1]). The species both historically and currently occupies one of the smallest geographic ranges of any species of *Phrynosoma* (Funk, 1981, in Mayhew and Carlson, 1986) and often is scarce in areas where it occurs (Turner and Medica, 1982).

The lizard's normal scarcity and observed declines in some portions of the range, coupled with the loss of large acreages of habitat due to development of desert areas, led to increased concern about the status of the species. Stewart (1971) and U.C. Berkeley Museum of Vertebrate Zoology staff expressed such concern, as did the Riverside County Planning Commission. In response, the U.S. Fish and Wildlife Service designated *P. mcallii* as a Category 2 candidate for Federal listing under the Endangered Species Act (16 U.S.C. 1531 *et seq.*) (47 FR 58457, December 30, 1982). Taxa in Category 2 include those:

> for which information now in possession of the Service indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules...Further biological research and field study may be needed to ascertain the status of taxa in this category...(50 FR 37958, September 18, 1985).

The Bureau of Land Management supported investigations of the status of *P. mcallii* in California between 1978 and 1980. The aim of these studies was to define the species' local distribution and relative abundance, and to correlate these with habitat attributes, as well as to investigate population structure, mobility, and food habits. This work is summarized in Turner and Medica (1982). In addition, Rado (n.d.) analyzed factors such as agricultural development, mineral exploration and development, and intensive recreational use which actually or potentially could contribute to habitat loss in California. BLM has further recognized the declining status of *P. mcallii* by including it in the group of sensitive species listed in the California

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[1] Figures are presented in Appendix A.

Desert Conservation Area Plan (USDI, BLM, 1980:36). Identification criteria for sensitive species include any one of the following:

a. plants and animals under status review or considered as candidates for listing by the FWS;

b. plants and animals proposed for Federal listing by the FWS;

c. plants and animals whose numbers are declining so rapidly that Federal listing may become necessary;

d. plants and animals with typically small and widely dispersed populations; and,

e. plants and animals inhabiting ecological refugia or other specialized or unique habitats (USDI, BLM, 1982a).

The goal of BLM's sensitive species management is:

> to manage the public lands so as to prevent deterioration of sensitive species' habitat thereby precluding the need for State or Federal listing of those species (USDI, BLM, 1982b).

The four areas in which *P. mcallii* remained well represented in 1979 were the Yuha, East Mesa, Ocotillo Wells/Benson Dry Lake, and Superstition Mountain/West Mesa (Turner and Medica, 1982). Extensive monitoring and additional inventory conducted by the Bureau during 1984-1986 have indicated severe declines in *P. mcallii* relative abundance in portions of the Yuha and East Mesa habitats (Olech, 1986). Transects performed by Anza-Borrego Desert State Park personnel in the Ocotillo Wells State Vehicular Recreation Area in 1986 indicate significant declines in *P. mcallii* relative abundance in this crucial habitat also (Jorgensen, pers. comm. to Carlson). Only the Superstition Mountain/West Mesa crucial habitat appears to retain extensive areas of high *P. mcallii* relative abundance (Olech, 1986). In addition, although less extensive monitoring conducted by the Bureau in 1987 indicated a stable trend in some portions of East Mesa, significant decreases appear to be continuing in the Yuha and some portions of the Superstition Mountain/West Mesa habitats.

These data led the U.S. Fish and Wildlife Service's Laguna Niguel Field Office, in 1987, to recommend that the species' status be elevated to Category 1 (USDI, FWS, 1987). Taxa in Category 1 includes those for which:

> the Service feels that it has substantial information to support the biological appropriateness of a listing proposal for the species.

In 1989, this recommendation was accepted, and the species was elevated to Category 1 (54 FR 559, January 6, 1989).

The Service included the preparation of a listing package in its 1988-1989 work plan.

2. State Status

a. Arizona

The precarious status of *P. mcallii* has also been recognized by the State of Arizona. The Arizona Game and Fish Commission has designated *P. mcallii* as a Group 3 species. This category includes:

> Species or subspecies whose continued presence in Arizona could be in jeopardy in the foreseeable future. Serious threats to the occupied habitats have been identified and populations (a) have declined or (b) are limited to few individuals in few localities (Arizona Game and Fish Commission, 1982, in Johnson and Spicer, 1985).

Although not legally binding in Arizona this designation results in consideration by State and Federal agencies during resource management planning. Arizona has also prohibited collection of the species except by permit (Arizona Game and Fish Regulation, Title 17, R12-4-443, Commission Order 43).

b. California

In January, 1988, Dr. Wilbur Mayhew (U.C. Riverside) and Barbara Carlson (Motte Rimrock Reserve) submitted a petition to the State of California Fish and Game Commission to list the species as endangered. The petition cited a decrease in flat-tailed horned lizard populations in three of the four high value habitat areas. Decreases were attributed to the impacts of geothermal development, nonapproved ORV use, sand and gravel development, past and present pesticide use, and indiscriminate cross-country travel by the U.S. Border Patrol. The Commission accepted the petition on May 13, 1988 (Cribbs, pers. comm. to Bontadelli). The petition is currently undergoing review by the Department. BLM has gone on record as supporting the proposed State listing of *P. mcallii* (see Appendix B).

California has also prohibited collection of the species except by permit (California Administrative Code 40.10, Title 14).

III. MANAGEMENT FRAMEWORK

A. Major Laws

1. Federal Land Policy and Management Act (FLPMA) of 1976

Section 601 of FLPMA (Public Law 94-579, October 21, 1976) established the California Desert Conservation Area and directed the Bureau to prepare a plan for the management of the Conservation Area. FLPMA (§102(a)(7), §102(a)(8) and §103(c)) mandated the Bureau to manage the public lands under a concept of multiple-use and sustained yield, placing wildlife resource management on an equal footing with other uses.

2. Endangered Species Act

The Endangered Species Act of 1973 (Public Law 97-304, *as amended*) charged all Federal agencies to seek the conservation of endangered and threatened species and to utilize their full authority to further the purposes of the Act. For terrestrial species, the U.S. Fish and Wildlife Service is responsible for designating species as threatened or endangered. Critical habitat is usually designated for each species listed. The Service also maintains a list of "candidate" plants and animals whose status is being sought.

Once a species is listed as threatened or endangered, Federal agencies must consult with the Service on any action which may negatively affect the species. The Service then renders a biological opinion on whether the proposed action will jeopardize the continued existence of the species. If so, alternative actions are recommended up to and including project denial.

It is illegal to take, possess, harass, sell, or transport any listed species. Individual animals held in captivity on the date of official listing are not included in these prohibitions. Permits may be issued for taking for scientific purposes or for the incidental taking of individuals of a listed species during the course of an otherwise legal activity.

3. California Endangered Species Act

In 1984 the State Legislature passed the California Endangered Species Act. This law is patterned after the Federal Endangered Species Act; it has similar provisions for consultations by State agencies, for listing of species, and for regulating take. The take provisions, however, are less restrictive than Federal provisions.

By policy as expressed in BLM Manual 6840.2, BLM consults with CDFG on its proposed activities which may affect state-listed species.

4. Sikes Act

The Sikes Act (Public Laws 93-452 and 95-420) authorizes the Bureau to develop and implement plans in cooperation with state fish and game departments for the development and protection of wildlife habitat. It authorizes the preparation of memoranda of understanding for the transfer of funds between agencies for the completion of projects, inventories, studies, and other programs.

5. Other Laws

There are a multitude of other acts which are significant in flat-tailed horned lizard management as they provide authority and mechanisms for regulating conflicting land uses. Among these are the Mineral Leasing Act, the Material Sales Act, the Multiple Surface Use Act, and the Geothermal Steam Act. These acts provide the framework for discretionary Bureau actions on several possible types of activities which occur in *P. mcallii* habitat. The National Environmental Policy Act (NEPA), together with its State counterpart, the California Environmental Quality Act (CEQA), provide mechanisms for public disclosure and review of the projected effects of proposed projects and activities.

B. California Desert Conservation Area Plan

The "Desert Plan", signed and approved in 1980 by the Secretary of the Interior, provides management guidelines for the use and protection of resources in the desert. The Plan provides for four major land use classes with various degrees of resource protection and consumptive use proscribed. The four classes are Controlled Use (C), Limited Use (L), Moderate Use (M), and Intensive Use (I). About 1.9 million acres (16%) are assigned to class C, about 5.9 million acres (49%) to class L, about 3.4 million acres (28%) to class M, about 0.5 million acres (4%) to class I, and about 0.3 million acres (3%) to unclassified. Guidelines restricting uses within the various classes were also established.

The Wildlife Element of the Desert Plan directed that Habitat Management Plans be developed to benefit *P. mcallii* habitat in two areas – the Yuha Desert and East Mesa (see Figure 2). Under Bureau policy, all such Habitat Management Plans are prepared cooperatively with the State Fish and Game Department under the authority of the Sikes Act.

In addition, the Desert Plan prescribed that two Area of Critical Environmental Concern (ACEC) Management Plans (Yuha Basin and Southern East Mesa) were to be prepared for smaller areas of key habitat within the Yuha and East Mesa Wildlife Habitat Management Plan areas. The boundaries of the Yuha Basin ACEC were significantly expanded through a Desert Plan Amendment in 1985, while a third ACEC (for Superstition Mountain/West Mesa)(see

Figure 2) was proposed as a Desert Plan amendment in 1987 (USDI, BLM, 1987), and was approved and designated in 1988.

In addition, two Desert Plan amendments proposed in 1989 would result in land use class changes, designating approximately 49,000 acres in the Yuha and 120,00 acres in East Mesa as L rather than M. This would eliminate sale or disposal without a site-specific plan amendment and attendant public involvement, and would provide a higher degree of management attention to managing potentially intrusive activities.

C. Land Ownership and Use Patterns

Land ownership and administration within the geographic range of the flat-tailed horned lizard in California is summarized in Table 1.

The majority of the species' habitat in California occurs on Federal lands administered by the Bureau of Land Management. The Bureau manages land under its jurisdiction based on the principles of multiple-use and sustained yield. The uses allowed and their distribution are prescribed by the California Desert Conservation Area Plan (see Section III.B). However, even under the guidelines of the Desert Plan, a decision on permitted actions must be reached through the Federal environmental assessment process prescribed by the National Environmental Policy Act. Within the principles of multiple-use/sustained yield management, various uses and resource values may conflict in a given area. Some of the issues which have arisen in the conservation of flat-tailed horned lizards and their habitat are described in Section IV.

The second largest acreage of FTHL habitat is privately owned. These lands are vacant, with no use or development. Agricultural development occupies large privately owned acreage of what was formerly FTHL habitat in the Imperial Valley and smaller areas in East Mesa.

Lands administered by the State Lands Commission are generally managed with a primary emphasis on economic development and a secondary emphasis on multiple-use principles. Other State and Federal agencies administer lands with a primary mission other than multiple-use. Among these are the Bureau of Reclamation, the California Department of Parks and Recreation (Ocotillo Wells State Vehicular Recreation Area) and the Department of Defense (Navy leased lands and other military reservations).

Table 1. *Administration of Lands within Flat-Tailed Horned Lizard Range in California* (adapted from Rado, n.d.)

Owner/Administrator			Acres (±)	Percentage[1]
Imperial County			1,328,000	69
	Federal		972,000	51
		Bureau of Land Management	640,000	33
		Bureau of Reclamation	20,000	T
		Military	123,000	6
		Other	9,000	T
	State		14,000	T
		Other	14,000	T
	Private		342,000	18
San Diego County			152,000	8
	Federal		0	0
		Bureau of Land Management	0	0
		Bureau of Reclamation	0	0
		Military	0	0
		Other	0	0
	State		104,000	5
		California Department of Parks and Recreation	104,000	5
		Other	0	0
	Private		48,000	T
Riverside County			433,000	23
	Federal		64,000	T
		Bureau of Land Management	56,000	T
		Bureau of Reclamation	0	0
		Military	0	0
		Other	8,000	T
	State		0	0
	Private		369,000	19

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[1] T = Trace

IV. SUMMARY OF ISSUES

Issues have been identified which may be associated with negative trends in *P. mcallii* relative abundance in the California Desert. These issues may be divided into four general categories: those affecting data collection and analysis, those directly affecting population, those affecting habitat, and those affecting interagency coordination. Collectively, these issues represent the negative factors which may result in further declines and at least localized extirpation of the flat-tailed horned lizard. A brief description of each issue is presented below. No order of priority is implied in any of the following discussion sections.

A. Data Base Issues

1. Standardization of Survey Methodology

Surveys are currently being conducted by several agencies (including BLM, California Department of Fish and Game, California Department of Parks and Recreation, and Bureau of Reclamation) in Arizona and California. Survey length and width, as well as the number of investigators performing each transect, is highly variable and non-standard. Transect locations are often not recorded or even known with any accuracy. In addition, private contractors are performing surveys in a non-standard manner. This results in the collection of data which are difficult to compare range-wide. It also results in the performance of surveys which are not repeatable, which significantly reduces their utility as monitoring tools. Some investigations are invalid because investigators have not been trained and tested for accuracy in detecting lizards and sign.

2. Standardization and Evaluation of Historic Data Base

Because of the variability outlined above, large differences in survey effort per transect have occurred. Some surveys were not correctly mapped. Previous delineations of crucial/optimal/prime habitat have been predicated on these highly variable surveys. Survey results must be standardized by effort per unit surveyed in order to determine habitat values and lizard relative abundance accurately. Other surveys may not be appropriate for inclusion as baseline surveys because their actual route or location is unknown.

3. Definition of Crucial/Optimal/Prime Habitat Areas

Four crucial (also variously termed optimal or prime) habitat areas have been defined by Turner and Medica (1982): north of Ocotillo Wells and Benson Dry Lake, south of Superstition Mountain, the Yuha Basin, and East Mesa. These areas were defined based on data discussed in A.1. and A.2., above. In addition, more recent survey data is now available.

4. Relationship of Relative Abundance to Actual Population Numbers

Current surveys rely primarily on counting scats because FTHLs are seldom encountered in the field due to their extreme rarity and small home range size. The direct relationship between scats observed per hour expended and actual number of FTHLs present is not known.

5. Population Monitoring Techniques and Schedules

The number and geographic distribution of transects monitored annually may be insufficient to give a true representation of FTHL status throughout its entire range. The current annual monitoring scheme consists of the repetition of at least 10 transects in each separate habitat area. Monitoring has been limited by the relatively short field season and small number of qualified investigators. The number of qualified investigators was limited by lack of time and funding to hire and train new people. As the number of investigators increases, a more extensive monitoring scheme will be possible.

B. Population Issues

1. Direct Losses from Large Scale Surface Disturbances

Large scale surface disturbances are causing direct losses of FTHLs both on and below the ground surface due to crushing. Examples include mineral material removal, geothermal development, and flooding (reservoirs).

2. Off-Highway Vehicle (OHV) Impacts

OHV travel is resulting in direct mortality of FTHLs both on and below the ground surface. Impacts occur both in concentrated areas (such as along race corridors) and in areas used occasionally by visitors.

3. Visitor Concentrations

Visitor concentrations typically occur at camping areas. OHV play activities are associated with camping areas. Concentrated use results in FTHL mortality as outlined above.

4. Impacts of Pesticide Use

Pesticide use may affect FTHL populations either directly through effects on lizards or indirectly through reductions in harvester ant (*Veromessor pergandei* and *Pogonomyrmex* spp.) populations which comprise the FTHL's prey base. Pesticides approved for use in the U.S. are not persistent but may still have an impact. Large-scale pesticide spraying in wild lands is carried out to control agricultural pests on an as needed basis. Drift may occur from local spraying. In addition, drift of more persistent pesticides from agricultural areas in Mexico may be occurring and could have more significant impacts.

C. Habitat Issues

1. Impacts of Large Scale Surface Disturbances

Large scale surface disturbances cause long term and often permanent loss of FTHL habitat. Examples of long term (but not necessarily permanent) habitat loss include mineral material sale sites which may be reoccupied by FTHLs after material removal activities end. Examples of long term permanent habitat loss include agricultural development. Other types of disturbance, such as geothermal development, also cause direct impacts to habitat such as loss through construction of permanent facilities. Impacts also can include habitat fragmentation due to roads or other linear constructions. This can reduce the species' ability to move from one area to another. Some degree of localized disturbance, however, may be compatible with continued FTHL use of habitat. Currently, there is no definition of degree of disturbance and habitat useability. This interacts with the lack of information on the species' breeding biology and absolute abundance.

2. Cumulative Impacts of Small Surface Disturbance

Land use actions (such as new roads or well pads) which disturb a small acreage of habitat can cause additional indirect impacts and be cumulatively significant, although the original individual disturbance is not significant. These small disturbances can create new public use patterns by creating access to previously unused areas.

3. Effectiveness of Mitigation Measures

Mitigation measures, which are project modifications or other actions designed to reduce an adverse impact of a proposed project, vary greatly in their effectiveness. The Bureau does not always have adequate funding either to monitor compliance with mitigating stipulations or to assess the effectiveness of mitigation measures developed for land use permits. Even with mitigation, development within habitat of concern usually results in a temporary or permanent net loss of habitat.

4. Compensation for Loss or Degradation of Habitat

Compensation is an appropriate counterbalancing payment made to offset the adverse effects of a proposed activity. Compensation usually offsets habitat loss by the enhancement of management capability elsewhere. Compensation may include habitat improvement, or studies which provide information on which to base management decisions not related to the impacting activity. Compensation in many cases includes habitat acquisition; in the case of the FTHL, however, most habitat is already in public ownership. Therefore, habitat acquisition would not be a primary compensation mechanism.

Compensation ratios are developed to determine the amount of compensation required to offset a given impact. Typical factors considered in developing compensation ratios for various other wildlife species have included:

a. value of habitat impacted to the species
b. costs of rehabilitating or protecting habitat
c. type of disturbance
d. time needed for recovery of habitat
e. life history and behavioral requirements of the species of concern
f. number of species on the site
g. other direct and indirect impacts
h. administrative costs of locating and purchasing habitat
i. costs of land acquisition itself.

As with mitigation, it must be recognized that there is a net loss in habitat even with compensation.

5. Preserve Size and Effectiveness

As more and more species' distributions have become restricted to protected refuges and parks, biologists have recognized that such preserves are often too small to insure the continuation of the resources for which they were designed. Key problems are that:

a. small reserves generally have fewer species and higher extinction rates than large reserves
b. some animals require large areas to survive
c. large reserves are better buffered against human activities and natural disasters
d. large areas are essential to minimize pressures of predation, parasitism, and competition by species from nearby disturbed areas
e. the ratio of perimeter to area is less with large areas.

The basic questions for the FTHL are:

a. how much land is required to protect a viable population into perpetuity given the existing and future levels of human use?
b. how many different areas are needed?

6. OHV Impacts

See discussion under B.2.

D. Interagency Issues

1. Coordination of Agencies

Management of FTHL habitat is affected by the activities of several local, State and Federal agencies, including California Department of Food and Agriculture, California Department of Transportation, the U.S. Border Patrol, Ocotillo Wells SVRA, the Bureau of Reclamation, Department of Defense, and the Bureau of Land Management. In addition, California Department of Fish and Game and the U.S. Fish and Wildlife Service have species management responsibilities. It is crucial that all pertinent agencies cooperate to benefit the species.

V. MANAGEMENT GOALS AND OBJECTIVES

The overall management goals for the FTHL are to maintain stable, viable populations in all crucial habitat areas and to promote species recovery. The following objectives are designed to achieve these objectives:

A. Delineate current "crucial" habitat which is required for species perpetuation.

B. Quantify the amount of habitat loss and deterioration occurring.

C. More precisely define the effects of competing activities on the FTHL and its habitat.

D. Minimize loss and deterioration of Category 1 and Category 2[2] habitat.

E. Obtain natural history information.

F. Insure the perpetuation of habitat supporting viable FTHL populations in all four habitat areas.

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[2] Characteristics of habitat categories are discussed in Action 6.

G. Establish interagency coordination and commitment necessary to meet management goals.

H. Develop and implement a monitoring program to determine progress toward the overall management goals of species preservation and recovery.

Section VI immediately following describes in detail the actions recommended to meet the above objectives.

VI. RECOMMENDED ACTIONS

A. Goal: Delineate current "crucial" habitat.

1. ACTION: Standardize survey methodology.

DISCUSSION: The FTHL occurs in both California and Arizona, on habitat managed by several different agencies. In order to be directly comparable, data must be gathered in a consistent manner. This allows the accurate determination of impacts and mitigations for proposed activities.

IMPLEMENTATION: Establish and perform transects per methodology in Appendix C. Any investigator performing transects must be trained and tested by experienced field personnel, to achieve at least 90% competence in perception and recognition of FTHLs and scat.

RATIONALE: Standardization of survey methods and assurance of investigator competence is essential to achieve accurate delineation of habitat values, as well as to obtain repeatable results for long term trend analysis.

2. ACTION: Standardize current and historic data bases.

DISCUSSION: Prime/optimal habitat was originally defined using survey data gathered in 1979 (Rorabaugh, 1979; Turner and Medica, 1982). The length and configuration of transects, number of investigators per transect, and time spent on each transect varied, resulting in vastly different amounts of effort being spent surveying different sections and therefore in non-comparable data.

IMPLEMENTATION: Examine original data sheets and contact investigators. Standardize data on a scat observed per investigator hour basis, after discussing methods with CDFG's biostatistician.

RATIONALE: By standardizing all data on a scat observed per investigator hour basis, a more accurate delineation of habitat values will be possible.

3. ACTION: Resurvey sections within Rorabaugh's (1979) and Turner and Medica's (1982) delineated prime/optimal habitat boundaries.

DISCUSSION: Four prime habitat areas have been delineated for the FTHL, based on work conducted in 1979. Habitat deterioration has occurred in these areas due to a variety of causes; some former habitat may no longer support FTHLs. In addition, some delineation of optimal habitat was based on casual observations and/or theoretical habitat parameters rather than on systematically collected data.

IMPLEMENTATION: Conduct surveys. Update data base if necessary.

RATIONALE: Updated information will contribute to a more accurate delineation of current habitat values.

4. ACTION: Delineate current low value areas amenable to rehabilitation.

DISCUSSION: Some areas now having no or low FTHL relative abundance can be rehabilitated by revegetation, fencing, or other measures.

IMPLEMENTATION: Examine areas. Determine if rehabilitation is feasible.

RATIONALE: It is important to identify areas which could support increased numbers of FTHLs in order to reach the overall management goals.

5. ACTION: Survey areas delineated as potential prime habitat by Rorabaugh (1979) to determine FTHL relative abundance.

DISCUSSION: Some areas previously delineated as potential prime habitat have not been surveyed. Inventories are necessary to determine FTHL values present.

IMPLEMENTATION: Survey potential "prime" habitat areas using the standard triangular transect methodology (see Appendix C).

RATIONALE: It is possible that additional areas of "prime" habitat occur but have not been pinpointed. Additional data will help to further define crucial areas.

6. ACTION: Redefine habitat values as Category 1, 2, and 3 based on the following criteria and goals. No longer use "prime" or "optimal", and replace references to prime and optimal with appropriate category designations.

DISCUSSION: Currently four prime/optimal habitat areas are defined, based on work done in 1979. Some of these surveys were not performed in a standardized way. The replacement of the concept of prime or optimal habitat with a three category system based on standardized relative abundance information, current data, and conflict levels will permit more efficient management as well as reducing confusion about terminology.

IMPLEMENTATION: Redefine habitats based on the following goals and criteria:

Items	Category 1 Habitat Areas	Category 2 Habitat Areas	Category 3 Habitat Areas
Category goals	Maintain stable, viable populations and protect existing FTHL habitat values; increase relative abundance.	Maintain stable, viable populations and halt further declines in FTHL habitat values.	Limit FTHL habitat declines and declines in relative abundance to the extent possible by mitigating impacts.
Criterion 1	Habitat Area essential to maintenance of viable populations.	Habitat Area may be essential to maintenance of viable populations.	Habitat Area not essential to maintenance of viable populations.
Criterion 2	Conflicts resolvable.	Most conflicts resolvable.	Most conflicts not resolvable.
Criterion 3	Medium to high relative abundance or low relative abundance contiguous with medium to high relative abundance.	Medium to high relative abundance or low relative abundance contiguous with medium to high relative abundance. Also includes areas potentially capable of rehabilitation within high and medium relative abundance.	Low to medium relative abundance not contiguous with medium or high relative abundance.
Criterion 4	Increasing, stable, or decreasing relative abundance.	Stable or decreasing relative abundance.	Stable or decreasing relative abundance.

The resulting distribution of habitat values is shown in Figure 3, which has been constructed using standardized data. Categories will be updated every 5 years, or upon the point of the species becoming State or Federally listed.

RATIONALE: Definition of habitat areas reflects new data and standardized historic data as well as conflict levels.

7. ACTION: Determine the degree of population separation and isolation by examining morphological, genetic, and ecological parameters.

DISCUSSION: Because of habitat fragmentation within the FTHL's range, there is no exchange of individuals between populations. Different populations may be developing into unique genetic subunits.

IMPLEMENTATION: Conduct studies.

RATIONALE: If differentiation is occurring it is important to manage representative portions of each genetically distinct group.

B. Goal: Quantify the amount of habitat loss and deterioration occurring.

8. ACTION: Reexamine and update habitat loss information presented in Rado (n.d.).

DISCUSSION: Rado (n.d.) compiled information on sources and corresponding acreage of actual and potential deterioration and loss of FTHL habitat through 1978. This should provide a baseline to which additional incremental deterioration could be added and other changes noted. However, some of the generic place names used do not correspond to names currently used. It is, therefore, necessary to obtain the original maps used by Rado in order to determine exact locations and extent of areas.

IMPLEMENTATION: Contact Rado. If possible obtain original maps or reproduce them. Update with more recent information. Track cumulative impacts using GIS.

RATIONALE: A definitive quantification of habitat loss and deterioration is needed to determine the degree of threat to the FTHL's continued existence, and to assess cumulative impacts.

9. ACTION: Determine the extent of approved and non-approved OHV use occurring in Category 1, 2 and 3 habitats.

DISCUSSION: OHV use is considered to be one of the most pervasive competing uses occurring in FTHL habitat.

IMPLEMENTATION: Contract the production of 1:65,000 scale aerial photos. These will be compared to 1979 photos already available, and the data will be incorporated into habitat maps discussed in Action 6.

RATIONALE: The information is necessary to determine cumulative impacts and to document new OHV use areas and routes.

C. Goal: More precisely define the effects of competing activities on the FTHL and its habitat.

10. **ACTION:** Continue to determine effects of OHV use on FTHL relative abundance.

DISCUSSION: The distribution of FTHLs and scat along transects has been shown to be significantly negatively correlated with OHV use (USDI, BLM, 1985a). In addition, declines in FTHL relative abundance appear to be associated with proliferation of OHV use (Olech, 1984). However, the additional area of indirect impacts resulting from the creation of a new route is not known, nor is the effect of different degrees of habitat fragmentation. These need to be investigated.

IMPLEMENTATION: Contract a study of the impacts of OHV use, including the impacts associated with various levels of habitat fragmentation, surface compaction, and impacts to vegetation.

RATIONALE: This information is necessary for making management decisions.

11. **ACTION:** Determine the effect of surface disturbances associated with geothermal facilities on the FTHL.

DISCUSSION: Geothermal development is occurring in FTHL range on East Mesa. Until 1987 development had generally remained to the west of high and medium value habitat. However, recent development has moved into more valuable habitat (see Figure 4). It is necessary to determine what level of development is compatible with retention of high and medium habitat values. A particular concern is the effect of habitat fragmentation.

IMPLEMENTATION: Conduct intensive surveys (see Appendix C) in areas proposed for development. Follow up after development by repeating surveys on an ongoing basis to determine impacts.

RATIONALE: The effects of geothermal development must be understood in order to mitigate effectively.

12. ACTION: Determine the effect of pesticide use on the FTHL and its prey base.

DISCUSSION: Much of the range of the FTHL occurs adjacent to agricultural land which is regularly sprayed with pesticides. Desert lands *per se* are also sprayed almost yearly to some extent to control agricultural pests. Pesticide drift (of chemicals no longer approved for use in the U.S.) may be occurring from nearby farm lands in Mexico. Illegal dumping may also be occurring. These factors may play a part in observed declines in FTHL relative abundance.

IMPLEMENTATION: Determine types, frequency and amount of pesticides being applied or drifting onto FTHL habitat and the areas involved. Contract studies of their impacts on the FTHL (direct mortality, bioaccumulation, reproductive effects) and its prey base, harvester ants.

RATIONALE: Pesticide effects must be considered in FTHL management decisions such as preserve location.

D. Goal: Minimize loss and deterioration of Category 1 and Category 2 habitats.

13. ACTION: Reduce the effects of OHV use on the FTHL.

DISCUSSION: OHV use directly affects FTHLs and their habitat, as shown by data gathered in the Yuha and West Mesa areas. Action should be taken to reduce the amount of Category 1 and 2 habitat affected.

IMPLEMENTATION: Through the route of travel review process, eliminate all routes not needed for access purposes. Reduce the number of redundant routes. Post and enforce closures.

RATIONALE: OHV use creates direct and indirect impacts to both FTHLs and their habitat.

14. ACTION: Discourage facilities and activities which concentrate visitors in and adjacent to Category 1 and 2 habitats.

DISCUSSION: Concentrations of visitors directly impact FTHLs and habitat values. Local extirpations can occur.

IMPLEMENTATION: Attempt to relocate proposed facilities and activities to areas outside Category 1 and 2 habitat. Examples include race pitting areas, spectator areas, and camping areas.

RATIONALE: This action will reduce direct impacts leading to local extirpations.

15. ACTION: Reduce the effect of geothermal development in Category 1 and 2 habitats.

DISCUSSION: Although most past geothermal development has occurred in areas of no or low value habitat, development is now occurring in more valuable areas. Habitat fragmentation is a key concern as development moves into Category 1 and 2 habitat.

IMPLEMENTATION: Reduce the number of roads associated with geothermal development. Consolidate facilities into corridors to the extent possible. Relocate facilities where possible to reduce direct impacts and habitat fragmentation in Category 1 and 2 habitats. Require slant drilling to avoid impacts, where technically feasible.

RATIONALE: The configuration of facilities and roads should be planned to minimize both direct and indirect impacts.

16. ACTION: Restrict new surface disturbing activities in Category 1 and 2 habitats to those which cannot be relocated elsewhere, as determined through the environmental assessment process.

DISCUSSION: Fifty-two percent of the FTHL's original range in California is subject to one or more use-oriented activities; this includes 57% of the currently defined "optimal" habitat (Rado, n.d.). As the species' status becomes increasingly precarious, additional loss and deterioration of habitat becomes cumulatively significant.

IMPLEMENTATION: Proposed surface disturbing activities should, where possible, be relocated to areas outside Category 1 and 2 habitats. Examples include new applications for mineral material sales. No conflicting activities should be permitted in areas designated as preserves (see Action 25).

RATIONALE: Surface disturbing activities should be permitted in a way that creates the minimum amount of habitat degradation. Project relocation, where feasible, is the preferred mitigation.

17. ACTION: Minimize surface disturbances to soil and vegetation through mitigation measures.

DISCUSSION: See Action 16.

IMPLEMENTATION: For surface disturbing activities in Category 1 and 2 habitats, which cannot be relocated, disturbance to soil and vegetation should be minimized by incorporating mitigation measures. For disturbances in Category 3 habitat, similar mitigations should be applied. Specific measures will be developed in site specific environmental assessments, and they will be incorporated as permit stipulations.

RATIONALE: This action will reduce direct impacts.

18. ACTION: Require rehabilitation and/or restoration of vegetation in Category 1 and 2 habitats, when determined feasible.

DISCUSSION: Rehabilitation of habitat disturbed by temporary activities, routes which have been designated as closed, or former mineral material sites, etc., will return habitats to carrying capacity and will reduce the possibility of visitors mistakenly driving on closed routes. It must be kept in mind that revegetation is very difficult in desert habitat. Plantings require watering during the period in which they are becoming established.

IMPLEMENTATION: In severely compacted areas, rip up the area (road bed, quarry site, etc.). Revegetate and irrigate. Scatter gravel or other material as appropriate to make the reclaimed area blend in visually with the surrounding substrate. Costs of rehabilitation associated with new activities not already approved should be borne by the project proponent and are in addition to any compensation fee.

RATIONALE: Returning degraded habitat to productivity will promote the overall management objectives.

19. ACTION: Require compensation for habitat degradation or loss in Category 1 and 2 habitats, as determined through the environmental assessment process.

DISCUSSION: The acquisition, enhancement, and protection of habitat assists in achieving the goal of maintaining stable, viable FTHL populations. Habitat enhancements include permanent improvements such as signing and habitat restoration; it does not include temporary measures. Studies to obtain information pertinent to conflict resolution or FTHL management are also included, as is contracted field work by investigators and methods approved by BLM, CDFG, and USFWS. The amount of compensation reflects both direct loss of habitat, and indirect and direct losses due to the future effects of the project.

IMPLEMENTATION: Apply the formula detailed in Appendix D where compensation is required. Compensation may be in the form of land, services, or funds. Services may include studies or habitat enhancement. Funds may be expended on studies, habitat enhancement, or land acquisition. No compensation funds should be spent on temporary measures. On Federal lands, the Bureau or other lead agencies, in consultation with the Department and the Service, will decide the amount of compensation; its form (i.e., services, funds, land); and, if land is the form of compensation, where land will be acquired.

RATIONALE: Compensation will, at least, partially offset local impacts to FTHLs and habitat.

20. ACTION: Increase enforcement of existing laws, regulations, rules, and permit stipulations, especially within Category 1 and 2 habitats.

DISCUSSION: A number of laws, etc., already exist. Expenditure of limited Bureau and CDFG enforcement time should be focused in high priority areas receiving impacts. Regular compliance monitoring can also be conducted by surface protection and other personnel.

IMPLEMENTATION: Carry out ongoing compliance checks. Analyze Category 1 and 2 habitat areas to determine priorities for patrol and enforcement of laws, regulations, rules, and permit stipulations dealing with OHV use and project development. Develop specific patrol and enforcement strategies for each Category 1 and 2 habitat.

RATIONALE: This action is necessary for effective management.

21. ACTION: Require compliance reports on projects utilizing FTHL mitigation measures.

DISCUSSION: Compliance reports would indicate whether mitigation measures are actually applied effectively.

IMPLEMENTATION: Brief compliance reports should be required of project proponents at the completion of the project, or periodically in the case of long term projects. The report would include mitigation procedures applied, problems with implementation of the mitigations, corrective actions taken and their effectiveness, actual cost, and results.

RATIONALE: This action will increase the effectiveness of future mitigation proposals as well as determining which measures are reasonable and prudent.

22. ACTION: Continue and expand current education program.

DISCUSSION: Loss and degradation of habitat associated with human activities can be reduced through education. With education, many more people will voluntarily assist in efforts to protect habitat.

IMPLEMENTATION: Currently an aggressive employee education and informational signing program is in place for employees of geothermal energy development companies. This should be expanded (especially through signing and information leaflets, as well as visitor contacts) to include the general visitor population; specific interest groups; planning agencies; and agency personnel having a high level of public contacts, such as rangers and wardens.

RATIONALE: Voluntary compliance gained through education will be an effective way to achieve management goals.

E. Goal: Obtain natural history information to assist in management.

23. ACTION: Obtain life history information, including but not limited to activity patterns, temperature range in active periods, food intake, a more definitive determination of home range size, population density, mortality, and longevity.

DISCUSSION: Current knowledge of life history parameters is very limited or based on very small sample sizes. Additional information is needed.

IMPLEMENTATION: Research existing information on *Phrynosoma* species. Contract life history study. Attempt to develop a population viability analysis.

RATIONALE: Management options (such as placement and/or configuration of roads or route networks, location and size of preserve areas) should take life history parameters into consideration.

24. ACTION: More accurately determine population density.

DISCUSSION: Habitat values are currently based upon relative abundance estimates. In order to include demographic factors in management decisions, more information should be obtained.

IMPLEMENTATION: Contract study to determine the relationship of scat counts to FTHL density.

RATIONALE: More definitive information will allow more informed management decisions.

F. Goal: Insure the perpetuation of habitat supporting viable FTHL populations in all four habitat areas.

25. ACTION: Establish preserves in all habitat areas, if determined feasible.

DISCUSSION: Preserves focus on conservation and management of target species or habitat communities. The designation of key areas as preserves would promote overall management goals.

IMPLEMENTATION: Recommend areas for designation. Submit Desert Plan amendments as appropriate to eliminate conflicting uses. Withdraw preserves from the operation of the general land laws, and mining and mineral leasing laws. Prepare a preserve management plan to outline management strategy and actions in each preserve. Recommendations will include consideration of current and likely future impacts, and also results of studies outlined in Action 23.

RATIONALE: Establishing and protecting more than one preserve increases the likelihood of the species' continued existence, by reducing the chance of a single catastrophic event resulting in extinction.

26. ACTION: Discourage land disposal or land exchange which would reduce the amount of public ownership in Category 1 and 2 habitats.

DISCUSSION: The intent is to maintain at least the current amount and configuration of habitat managed to promote species conservation. It is imperative that the land base within Category 1 and 2 habitat not be diminished.

IMPLEMENTATION: Discourage any disposal of Category 1 habitat. Consider land exchange proposals only if involving Category 1 habitat for Category 1 habitat, or Category 1 habitat for other land plus a compensation package for Category 1 which is either as large as the lands lost or is as calculated by the formula in Appendix D, whichever is larger. Exchanges should also consider the proposed uses of the area lost. Implementation includes changes in Multiple Use Class for Yuha and East Mesa from class M to class L. This is currently proposed as an amendment to the Desert Plan for 1989.

RATIONALE: Maintaining a habitat base is essential to achieving effective and efficient management.

27. ACTION: Allow exchange or disposal of Category 3 habitat only if accompanied by an adequate compensation package.

DISCUSSION: Category 3 habitat is generally by definition not manageable to achieve overall species management goals. Compensation for disposal or exchange of this habitat could, however, contribute to overall species perpetuation and management.

IMPLEMENTATION: Require compensation as outlined in Appendix D.

RATIONALE: Compensation will facilitate management of Category 1 and 2 habitats.

G. Goal: Establish interagency coordination and commitment necessary to meet overall management goals.

28. ACTION: Prepare one or more Habitat Management Plans (HMPs) for the FTHL between BLM and CDFG under the authority of the Sikes Act.

DISCUSSION: HMPs provide the framework for FTHL management on specified areas of land. Such plans are site-specific in nature and address localized management concerns.

IMPLEMENTATION: Two Sikes Act HMPs (Yuha Desert and East Mesa) have already been written for management of the FTHL and its habitat. A third plan (West Mesa) will be prepared. If additional areas of high value habitat are defined on BLM land, HMPs should also be developed for these areas.

RATIONALE: An HMP is the appropriate mechanism for instituting specific management recommendations. It is BLM policy that HMPs be developed jointly with CDFG.

29. ACTION: Encourage the development of a habitat management plan between CDFG and California Department of Parks and Recreation (CDPR) for FTHL habitat within Anza Borrego Desert State Park and Ocotillo Wells SVRA.

DISCUSSION: While Anza-Borrego Desert State Park and Ocotillo Wells presently have General Plan which would include long range goals for the FTHL, resource management goals for State Parks include the perpetuation of native species within each park unit. Management in ABDSP is coordinated with CDFG. OHV use is not allowed in ABDSP and highway-legal vehicles are only allowed on designated routes, which are patrolled five days a week by aircraft and seven days a week by field rangers. Coordination is also occurring in Ocotillo Wells SVRA.

IMPLEMENTATION: Develop a management plan between CDFG and CDPR for FTHLs on lands in Ocotillo Wells SVRA.

RATIONALE: A joint management plan will facilitate implementation of effective FTHL management in Anza-Borrego Desert State Park and Ocotillo Wells SVRA.

30. ACTION: Maintain interagency cooperation in FTHL conservation by continuing to hold semiannual meetings of the FTHL Interagency Technical Advisory Committee (ITAC).

DISCUSSION: The ITAC was formed in 1985 as a result of a management recommendation in the Yuha Desert HMP. The ITAC has met semiannually since that time and has facilitated information transfer and species and habitat management coordination between the agencies involved.

IMPLEMENTATION: Continue to hold ITAC meetings semiannually to discuss FTHL management. Participants currently include BLM, Bureau of Reclamation, CDFG, CDPR, U.C. Riverside, and USFWS. Consider expansion of the committee to include participation by California Department of Food and Agriculture (CDFA), Imperial County Agricultural Commissioner, and U.S. Border Patrol (USBP).

RATIONALE: The semiannual meeting serves to disseminate information, resolve conflicts, identify funding sources, and promote efficiency in management efforts. The additional agencies are involved in management activities that affect FTHLs and their habitat. Their participation would help to better coordinate activities and reduce impacts.

31. ACTION: Encourage other agencies to implement these recommendations on lands under their jurisdiction.

DISCUSSION: Other agencies – such as USBP, CDFA, CDPR, DOD (U.S. Navy) and the Imperial County Agricultural Commissioner – conduct or regulate activities in and adjacent to FTHL habitat.

IMPLEMENTATION: Through meetings and in review of environmental documents, BLM and CDFG will encourage other agencies to use their authority to protect and enhance FTHL populations and habitat by applying these recommendations, where appropriate, to lands and activities under their jurisdiction. The semiannual ITAC meetings will also provide opportunities to discuss these recommendations.

RATIONALE: Many of the factors affecting FTHLs and their habitat are controlled or conducted by agencies other than BLM and CDFG. In order to accomplish the overall management goal of maintaining stable, viable FTHL populations, it will be essential that other agencies act in a manner consistent with this plan's recommendations.

H. Goal: Develop and implement a monitoring program.

32. ACTION: Develop a monitoring program to measure the status and trend of the FTHL in all crucial habitat areas.

DISCUSSION: In order to determine budget and time priorities a systematic monitoring scheme should be developed. The scheme must be developed in coordination with biostatisticians in order to make it reliable and valid.

IMPLEMENTATION: Confer with CDFG biostatistician on methods and implementation schedule. Develop program. Add as an Appendix to the current plan.

RATIONALE: Monitoring must be systematic and valid in order to produce results for use in management decisions.

33. **ACTION:** Determine the effectiveness of mitigation measures.

DISCUSSION: It is important to know which mitigations are effective and which are not. Continued use of ineffective measures is detrimental to the species and puts an unreasonable burden on project proponents.

IMPLEMENTATION: Compile and maintain a list of mitigation measures and permit stipulations designed to benefit the FTHL. Examine the effectiveness of those measures which have been applied systematically. Modify measures as needed to increase their effectiveness, and discontinue the use of ineffective measures. Distribute results to other agencies.

RATIONALE: The effectiveness of mitigation must be determined in order to make proper management decisions.

34. **ACTION:** Determine the effectiveness of this management plan.

DISCUSSION: Periodic review is necessary to determine if the actions proposed in this plan are being effectively implemented and are promoting the plan objectives.

IMPLEMENTATION: Review this plan every five years. If the FTHL becomes listed as threatened or endangered before the five year review period, review the plan at the time of listing. Assign updated habitat values at the time of plan review, based on new field data. Update habitat maps as appropriate. Revise Actions as necessary to reflect findings during plan review.

RATIONALE: Periodic review and update of this document will increase the likelihood of reaching management objectives.

VII. ENVIRONMENTAL ASSESSMENT

A. Introduction

The flat-tailed horned lizard (*Phrynosoma mcallii*) has been a species of increasing concern to State and Federal management agencies in California since the late 1970's. This increasing management profile has been due to observed declines in much of the species' range. This concern has accelerated in the last year, during which the species has become a candidate for State listing as endangered as well as being upgraded by the U.S. Fish and Wildlife Service to Category 1 candidacy for inclusion on the Endangered Species List.

Although local management plans have been prepared for two of the four crucial habitat areas defined by Turner and Medica (1982), the species' declining status has made apparent the need for a species management plan which defines survey, management, and mitigation strategies. The Bureau of Land Management, in coordination with the California Department of Fish and Game and the U.S. Fish and Wildlife Service, has therefore prepared the present document.

It should be noted that many of the mitigations, as they relate to geothermal development, have been implemented in the environmental review process for siting facilities on Federal lands.

B. Proposed Action and Alternative

1. Proposed Action

The Bureau of Land Management proposes to implement Actions 1 through 34 of *Management Strategy for the Flat-tailed Horned Lizard* (Phrynosoma mcallii) *on Bureau of Land Management Administered Lands within the California Desert Conservation Area.*

2. No Action Alternative

If the Proposed Action is not implemented a desert wide flat-tailed horned lizard (FTHL) management and habitat compensation strategy will not be available. The Proposed Action calls for uniform standards for surveys and monitoring, classifies habitat, and formulates mitigation and compensation requirements. Such a strategy is crucial to the long-term survival of the species in California. It is critical to begin wide scale management at the earliest opportunity in order not to preclude options for future preserves and not to reduce numbers within crucial habitat areas to a level at which species recovery is not possible.

Since the No Action Alternative would fail to meet the Bureau's stated objectives for the management of sensitive species (USDI, BLM, 1982b), it is not considered viable and will not be discussed further.

C. Affected Environment

An overview of the affected environment can be found in the following documents:

- Yuha Basin/Mt. Signal non-competitive geothermal leasing EAR (USDI, BLM, 1980b)
- East Mesa non-competitive geothermal leasing EAR (USDI, BLM, 1981)
- East Mesa Wildlife Habitat Management Plan (USDI, BLM, 1982c)
- 1985 proposed Desert Plan amendment draft EA (USDI, BLM, 1985a)
- Yuha Desert Management Plan (USDI, BLM, 1985b)
- San Sebastian Marsh/San Felipe Creek Management Plan (USDI, BLM, 1986)

Because of the large area covered by the current management strategy document, only wildlife, and those resources directly negatively affected by the proposed actions, will be specifically discussed in this EA. For more detail and a discussion of other resources, the above-listed documents should be consulted.

1. Wildlife Species of Special Concern

Flat-tailed Horned Lizard (FTHL)

The FTHL is a candidate for listing by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game. The species has a small geographic range and is often scarce in areas in which it occurs. Surveys and monitoring between 1979 and 1988 have shown severe declines in FTHL relative abundance in much of its range in California (Olech, 1984, 1986; Carlson and Mayhew, 1986). (Note: A more detailed discussion is presented in Section II of the present management plan.)

Colorado Desert Fringe-toed Lizard (CDFTL)

The CDFTL is also a candidate for USFWS listing. This lizard is highly specialized to inhabit windblown sand habitat. The species is sympatric with the FTHL within the FTHL's range where patches of eolian sand or isolated dunes occur, as well as along the margin of large dune systems and sandier portions of creosote bush scrub habitat.

2. Geothermal

The current range of the FTHL in the California Desert Conservation Area overlaps five Known Geothermal Resource Areas (KGRAs): Dunes, East Mesa, Glamis, Heber, and Salton Sea. Two other KGRAs, Brawley and Westmorland, are within the probable historic range of the species but are now generally developed as urban or agricultural areas. The locations of these KGRAs are shown on Figure 5. KGRAs are areas:

> ...in which the geology, nearby discoveries, competitive interests, or other indicia would, in the opinion of the Secretary, engender a belief in men who are experienced in the subject matter that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose (§43 CFR 3200.0-5(k)).

Although leases had been issued for Public Lands throughout much of Imperial County, the leases outside of East Mesa have been relinquished. Serious exploration and development have occurred on Public Lands only in East Mesa. A discussion of the East Mesa geothermal resource may be found in Ormat Geothermal (1988). Development to date has been confined to an approximately 2.5 mile by 4.5 mile area just north of Interstate Highway 8 and east of the East Highline Canal (see Figure 4). Development before 1987 generally occurred outside of Category 1 FTHL habitat. More recently, however, facilities have been permitted in high value FTHL habitat. In these cases, full consideration was given to impacts to the FTHL. Facilities have been relocated, and leases have included appropriate mitigation and compensation stipulations.

3. Recreation

Recreation use – especially in the three crucial habitat areas of East Mesa, Yuha, and Superstition Mountain – is variable.

Major recreation centers in or near Category 1 FTHL habitat in East Mesa occur near the Coachella Canal and near the juncture of the East Highline Canal and I-8. Use of the Coachella Canal area occurs near the canal's confluence with the All-American Canal and near Drop 1. Use in these areas consists of camping and associated OHV play riding. Use near the East Highline is primarily long-term camping within a BLM-designated Long Term Visitor Area. Recreation use of interior East Mesa is very low because of limited access (few routes of travel exist) and the very sandy substrate. No competitive events occur here.

The Yuha Basin also receives relatively light recreation use compared to other parts of the Resource Area. Even weekends do not receive substantial casual use. Most casual use consists of dispersed camping and trail riding. Competitive use, however, occurs on a BLM-approved race course system. There will be three events in the Yuha in 1989. Competitive use is approved subject to a number of stipulations designed to protect the FTHL and its habitat. These include seasonal restrictions and limiting the number of events to five per year.

The Superstition Mountain (West Mesa) area receives a higher level of recreation use than either East Mesa or the Yuha. Camping occurs primarily in the "Rock House" vicinity, and around the Ancient Dry Lake. Casual OHV use in the past included both trail riding and cross-country riding. However, BLM has gone through land use classification and a route of travel approval process to determine permissible types of recreation uses. Much of the vehicle use in FTHL habitat will be confined to approved routes of travel; these route decisions were effective on February 15, 1989. Competitive OHV use also occurs in the area; eight events are approved for 1989. In 1989 BLM will also be designating an approved race course system on West Mesa.

4. Sand and Gravel

Most mineral material sales sites in the management plan area occur in East Mesa adjacent to the East Highline Canal, between Interstate Highway 8 and State Highway 78. The areas of active extraction are either outside of FTHL habitat or are of extremely low value. Areas north of Highway 78 were subject to mineral material removal in the past, but most of the suitable material has been mined out.

Some extraction areas occur in the Yuha. These include an Imperial County free use permit north of State Highway 98, and an area under permit to a private individual in the southeastern part of the Yuha. Both areas are within generally defined Category 1 habitat.

D. Environmental Consequences

1. Proposed Action

Implementation of the Proposed Action will result in several potential impacts. These are discussed below.

a. Wildlife resources – especially species of special management concern – will benefit substantially from the implementation of a coordinated management strategy. Management capability will be improved by the codification of standard methods of data collection and analysis, as well as monitoring strategies. Resource allocations and impact analysis for proposed activities within FTHL habitat will be made based upon improved information.

b. The effectiveness of mitigation measures will be more accurately known. Compensation requirements will also be standardized. This will allow more efficient processing of applications, and will make project proponents aware of mitigation and compensation requirements at an early stage in the planning process.

c. Impacts to future geothermal resource development will be both positive and negative. As stated, applications will be able to be processed more efficiently, and proponents will be aware of required mitigations and compensation early in the planning process. Mitigation and compensation may result in additional capital outlays by project proponents if future development is proposed in higher value FTHL habitat. However, existing leases contain these stipulations and have been agreed to by project proponents. Therefore no additional impacts will occur to already permitted activities as a result of the present plan.

d. Currently, recreation use in the majority of FTHL habitat is constrained by land use classifications confining vehicle travel to approved routes. Competitive use is also prescribed by existing management plans. In the future, however, it is possible that additional routes would be closed to casual and/or competitive use if studies called for in this management plan determine that certain impacts of recreation use were substantially detrimental to FTHL populations. It would then be BLM's responsibility to reduce these impacts per existing criteria in Executive Order 11644: "areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitat."

e. Current mineral material removal sites would not be impacted. However, future sites in Category 1 and 2 habitats would be subject to mitigation and compensation as outlined in the present plan.

f. The designation of preserve areas and the recommendation that these be protected from conflicting uses could impact geothermal, recreational, and mineral material activities to varying degrees. Since most of the geothermal resource presently considered developable is outside high value FTHL habitat, and existing leases already carry protective stipulations, the impact to geothermal development will be low. Preserve areas would most likely be chosen in protected areas not subject to other uses, whenever possible. This would also be true with regard to recreation use. Mineral material sales sites are generally located outside high value FTHL habitat. The desire for a protected preserve location away from convenient public access would make such an area undesirable for sand and gravel removal because of extremely high hauling costs.

E. Irreversible and Irretrievable Commitment of Resources.

Implementation of the proposed plan will result in the commitment of manpower and funds.

F. Unavoidable Adverse Impacts

Detailed impact analysis is presented in Section D. Although impacts are mitigatable to an acceptable level, some unavoidable adverse impacts may occur. It is possible that some localized recreational uses may be curtailed in the future. Costs of future geothermal and mineral material development may increase due to requirements for mitigation and compensation. Some areas designated as preserves may be removed from other uses.

G. Finding of No Significant Impact

We have reviewed the environmental assessment prepared to analyze the environmental effects of the proposed action and have determined that the proposed action and approved mitigation measures would not have significant environmental effects on the human environment. Therefore, an environmental impact statement is not required to further analyze the environmental effects of the proposed action.

Prepared by:

Lillian A. Andris-Olech 7/26/89
Wildlife Biologist Date
El Centro Resource Area

Recommended by:

Patrick Welch 9/6/89
Chief, Branch of Resource Program Operations Date

Approved by:

9/6/89
Area Manager Date

APPENDIX A - FIGURES

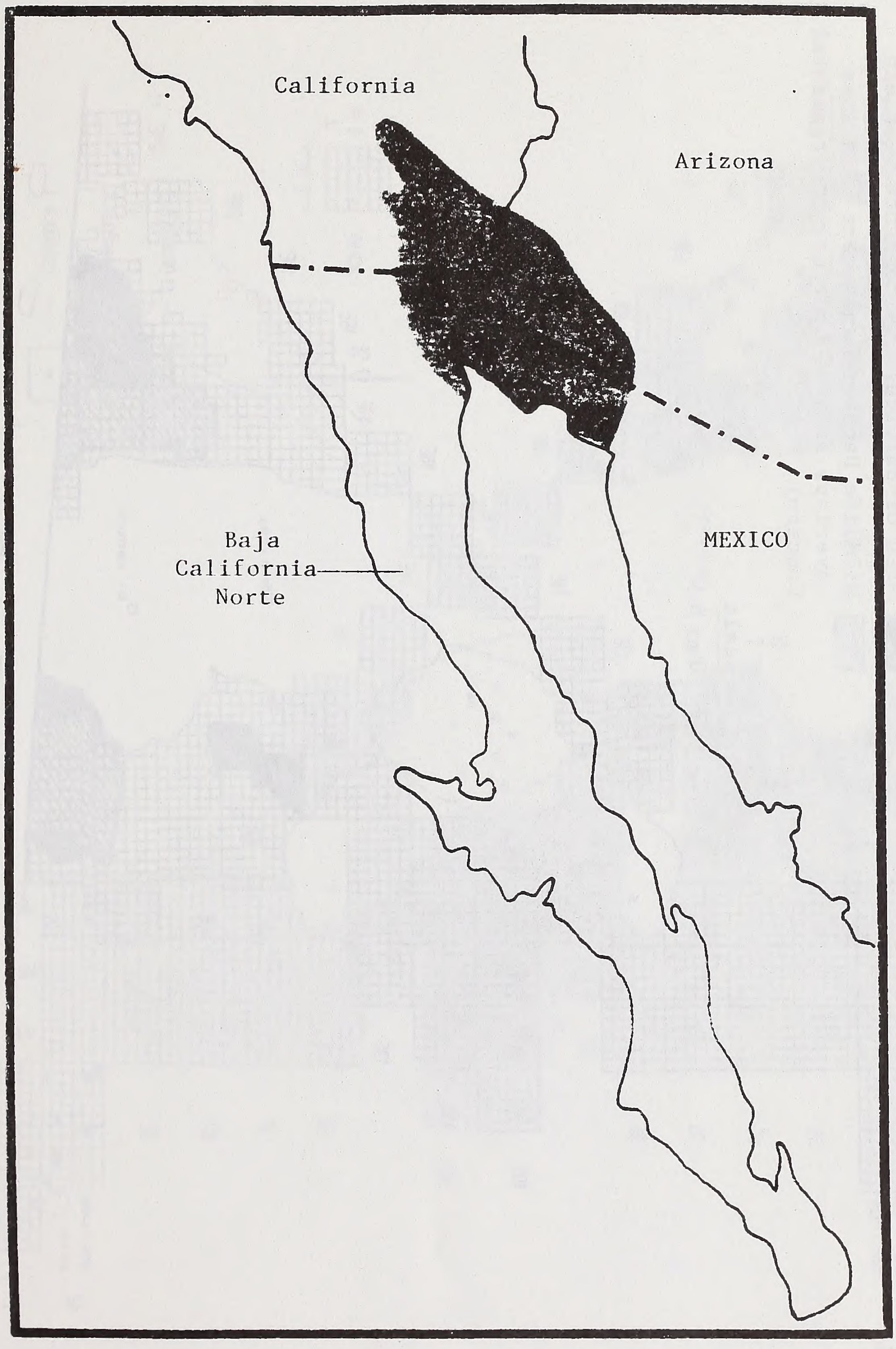

California
Arizona
Baja
California
Norte
MEXICO

Figure 1. Flat-tailed Horned Lizard (Phrynosoma mcallii) distribution (after Stebbins, 1966).

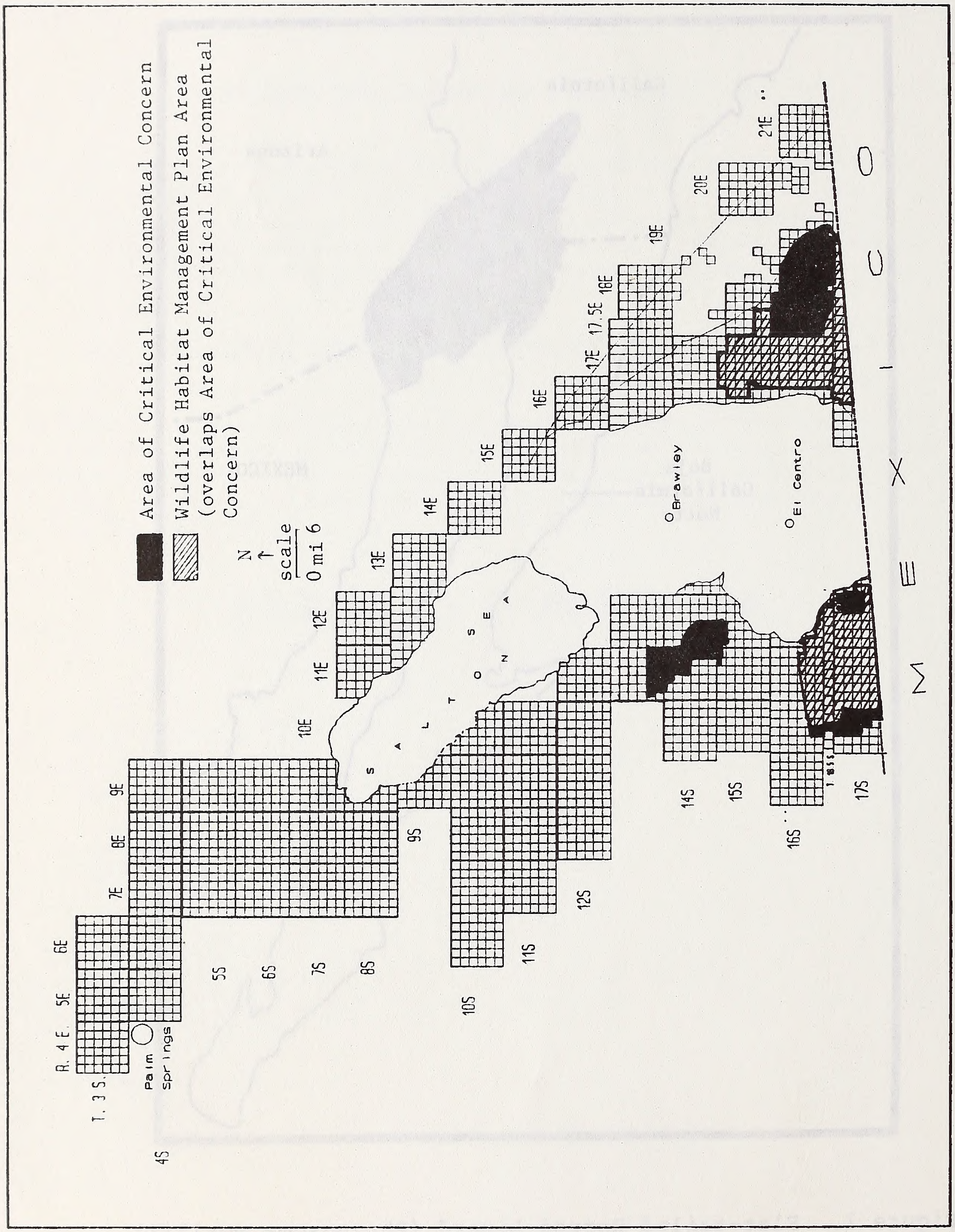

■ Area of Critical Environmental Concern
▨ Wildlife Habitat Management Plan Area (overlaps Area of Critical Environmental Concern)
N
scale
0 mi 6
Palm Springs
Brawley
El Centro
SALTON SEA
MEXICO
T. 3 S.
R. 4 E.
5E
6E
7E
8E
9E
10E
11E
12E
13E
14E
15E
16E
17E
17.5E
18E
19E
20E
21E
4S
5S
6S
7S
8S
9S
10S
11S
12S
14S
15S
16S
16.5S
17S

Figure 2. Special Management Areas.

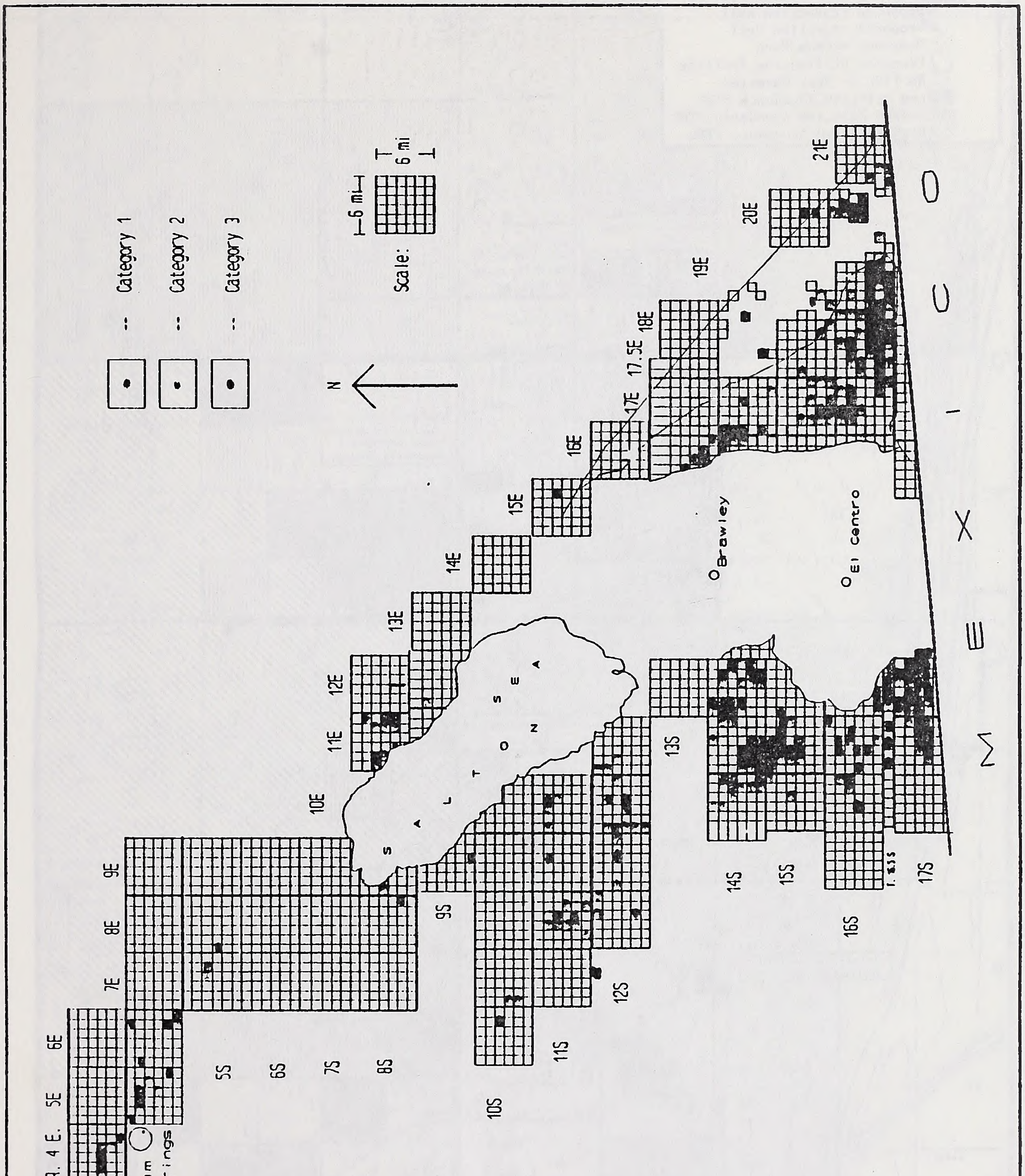

T. 3 S.
R. 4 E.
5E
6E
7E
8E
9E
10E
11E
12E
13E
14E
15E
16E
17E
17.5E
18E
19E
20E
21E
4S
5S
6S
7S
8S
9S
10S
11S
12S
13S
14S
15S
16S
T. 16.5 S
17S
Palm Springs
S A L T O N S E A
Brawley
El Centro
M E X I C O
N
-- Category 1
-- Category 2
-- Category 3
Scale:
6 mi
6 mi

Figure 3. Habitat Categories within the Range of the Flat-tailed Horned Lizard in California.

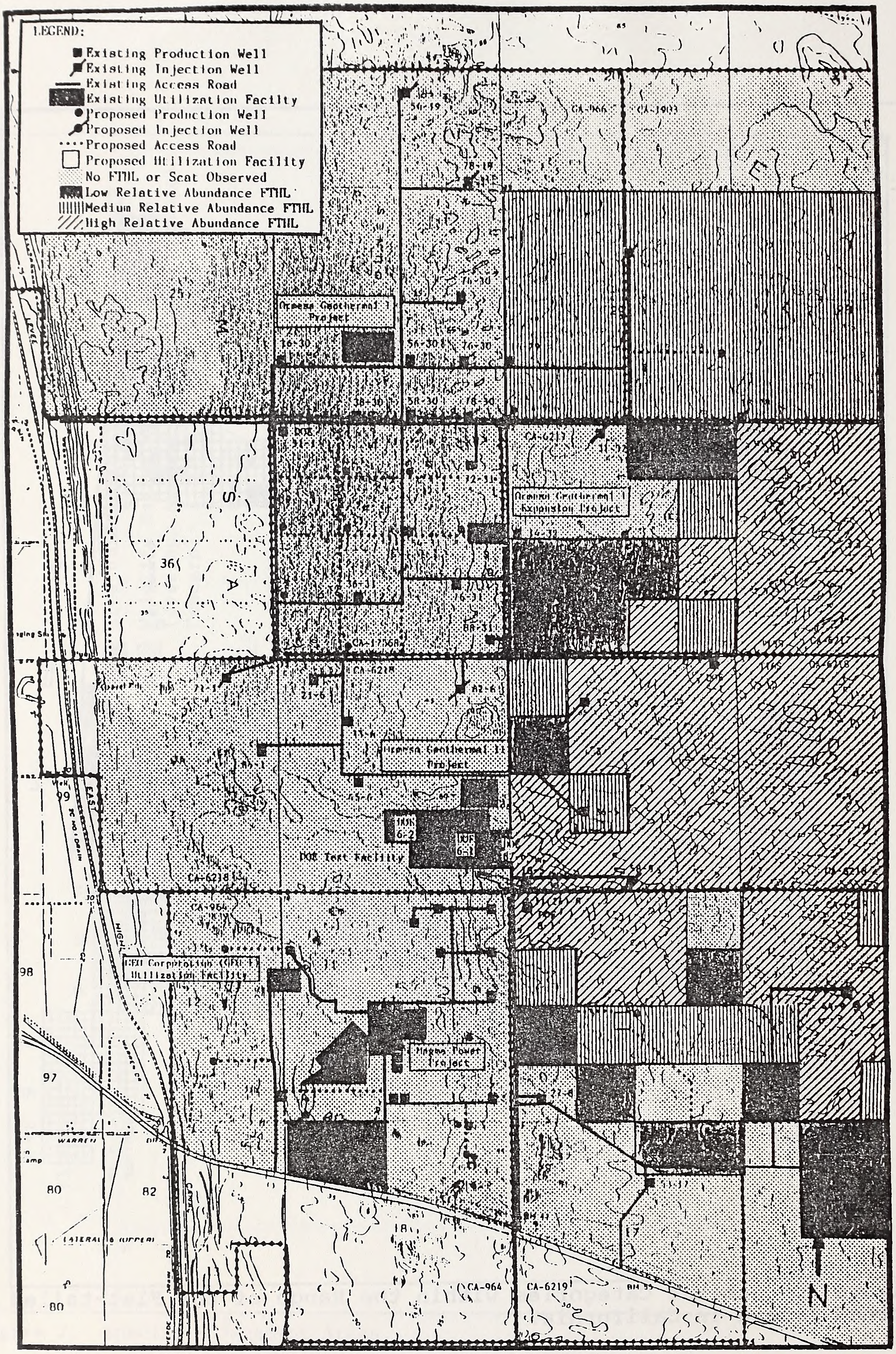

LEGEND:
Existing Production Well
Existing Injection Well
Existing Access Road
Existing Utilization Facility
Proposed Production Well
Proposed Injection Well
Proposed Access Road
Proposed Utilization Facility
No FTHL or Scat Observed
Low Relative Abundance FTHL
Medium Relative Abundance FTHL
High Relative Abundance FTHL
Ormesa Geothermal I Project
Ormesa Geothermal I Expansion Project
Ormesa Geothermal II Project
DOE Test Facility
DOE 6-1
INSK 6-2
GEO Corporation (GEO-1) Utilization Facility
Magma Power Project
CA-966
CA-1903
CA-6217
CA-6218
CA-17568
CA-964
CA-6219
36
99
98
97
80
82
80
18
N

Figure 4. Geothermal Development (through June 30, 1988).

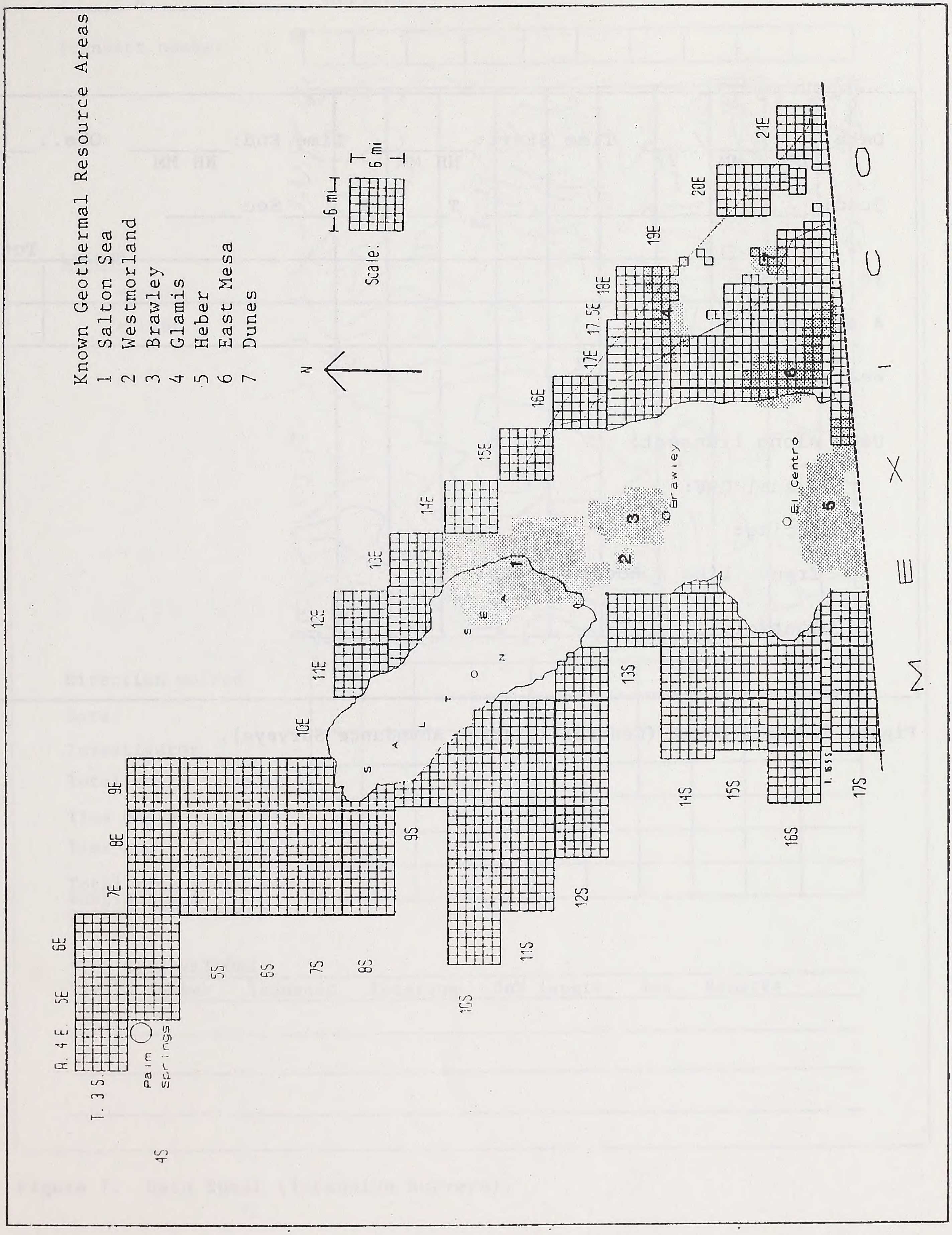

Known Geothermal Resource Areas
1 Salton Sea
2 Westmorland
3 Brawley
4 Glamis
5 Heber
6 East Mesa
7 Dunes
N
Scale:
6 mi
6 mi
R. 4 E.
5E
6E
7E
8E
9E
10E
11E
12E
13E
14E
15E
16E
17E
17.5E
18E
19E
20E
21E
T. 3 S.
4S
5S
6S
7S
8S
9S
10S
11S
12S
13S
14S
15S
16S
16.5S
17S
Palm Springs
Brawley
El Centro
SALTON SEA
MEXICO

Figure 5. Known Geothermal Resource Areas (KGRAs) within Flat-tailed Horned Lizard Range in California.

Date:____/____/____ Time Start:________ Time End:________ Obs.:______
DD MM YY HH MM HH MM III

Quad:__________________________ T______ R______ Sec______

		Total
#P. mcallii		
# scat obs.		

Weather:

Uses along transcect:

Casual ORV:

Racing:

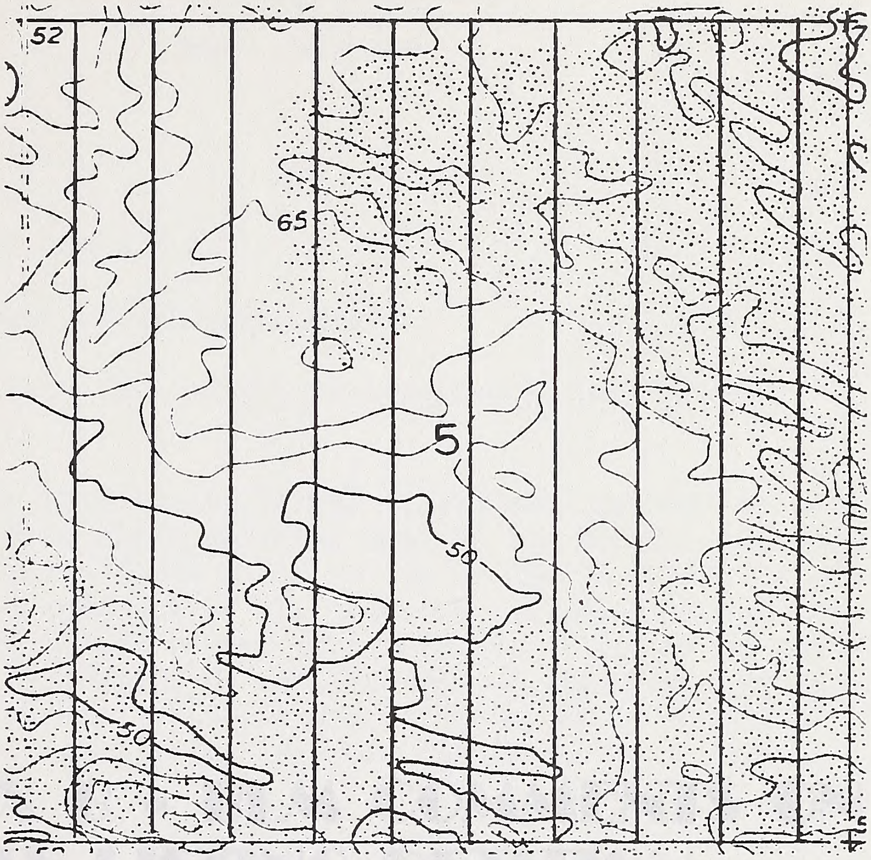
Trans. Line & Access Roads:

Control:

Figure 6. Data Sheet (General Relative Abundance Surveys).

T_____ R_____ sec._____ Meridian_____

Transect number										



LEGEND

= scat

= FTHL

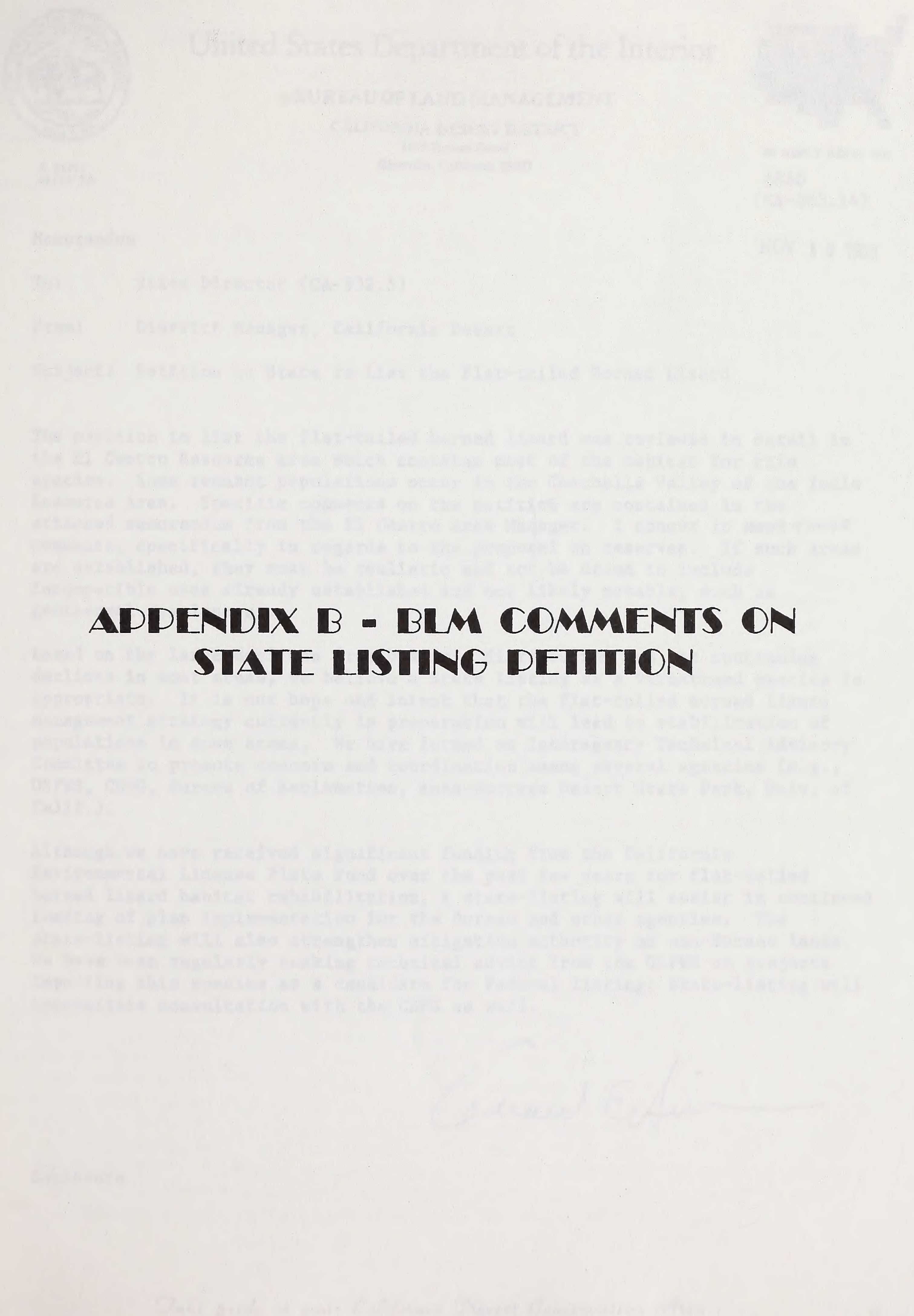
Direction walked										
Date										
Investigator										
Total scat/lizards										
Time begin										
Time end										
Total time (note and subtract non-performance times)										

FTHL OBSERVATIONS

Lizard number	Transect	Location	SnV length	Sex	Remarks

Figure 7. Data Sheet (Intensive Surveys).

APPENDIX B - BLM COMMENTS ON STATE LISTING PETITION



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

CALIFORNIA DESERT DISTRICT

Memorandum

NOV 1 9 19[illegible]

To: State Director (CA-932.5)

From: District Manager, California Desert

Subject: Petition to State to List the Flat-tailed Horned Lizard

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

CALIFORNIA DESERT DISTRICT
1695 Spruce Street
Riverside, California 92507

IN REPLY REFER TO:

IN REPLY REFER TO:
6840
(CA-063.14)

Memorandum

NOV 10 1988

To: State Director (CA-932.5)

From: District Manager, California Desert

Subject: Petition to State to List the Flat-tailed Horned Lizard

The petition to list the flat-tailed horned lizard was reviewed in detail in the El Centro Resource Area which contains most of the habitat for this species. Some remnant populations occur in the Coachella Valley of the Indio Resource Area. Specific comments on the petition are contained in the attached memorandum from the El Centro Area Manager. I concur in ~~most~~ THOSE comments, specifically in regards to the proposal on reserves. If such areas are established, they must be realistic and not be drawn to include incompatible uses already established and not likely movable, such as geothermal development.

Based on the large declines from historic distribution and the continuing declines in most areas, we believe a State listing as a threatened species is appropriate. It is our hope and intent that the flat-tailed horned lizard management strategy currently in preparation will lead to stabilization of populations in some areas. We have formed an Interagency Technical Advisory Committee to promote concern and coordination among several agencies (e.g., USFWS, CDFG, Bureau of Reclamation, Anza-Borrego Desert State Park, Univ. of Calif.).

Although we have received significant funding from the California Environmental License Plate Fund over the past few years for flat-tailed horned lizard habitat rehabilitation, a state-listing will assist in continued funding of plan implementation for the Bureau and other agencies. The state-listing will also strengthen mitigation authority on non-Bureau lands. We have been regularly seeking technical advice from the USFWS on projects impacting this species as a candidate for Federal listing; state-listing will necessitate consultation with the CDFG as well.

Edward E.

Enclosure

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
El Centro Resource Area
333 South Waterman
El Centro, California 92243

IN REPLY REFER TO
6840
(CA-067.23)

October 27, 1988

MEMORANDUM

To : District Manager, California Desert (CA-063.14)

From : Area Manager, El Centro

Subject : Review of State Listing Petition for the Flat-tailed Horned Lizard

The El Centro Area Office has reviewed the subject petition. Overall, the petition correctly reflects trends in flat-tailed horned lizard (FTHL) relative abundance as determined through field monitoring in key habitat areas since 1984. However, we would like to clarify certain statements in the petition as well as update the information presented in several sections. Specific comments are presented below.

Section III. The petition states that designations as Federal candidate and BLM sensitive do little to prevent FTHL habitat destruction. It should be recognized that BLM is mandated by BLM Manual 6840 to "improve populations and habitats" of ... animals which are candidates for listing, proposed listed, or officially listed by the Federal government as being in potential danger of extinction (ie., threatened or endangered) to a point at which protection under the Endangered Species Act is no longer proposed or necessary. BLM is also directed "to manage the public lands so as to prevent deterioration of sensitive species' habitat, thereby precluding the need for State or Federal listing" (CSO IM CA-82-190). It should be recognized that, pursuant to these mandates, BLM has accorded the FTHL an exceptional level of consideration in making resource allocations. Mitigations for proposed geothermal development include relocation and minimization of facilities, route closures, employee education, and monitoring of FTHL status, plus compensation to be determined through interagency coordination. BLM has also prepared a management strategy document (now in draft) to standardize survey methods, habitat value determination, and mitigation and compensation strategy. The document has been prepared in close coordination with CDFG and USFWS. BLM is also proposing Desert Plan amendments to change large portions of FTHL habitat from Class M to Class L.

The petition states that the cause of population declines is habitat destruction. This appears to be true in local situations in certain portions of at least the Yuha and East Mesa habitats. Other areas have suffered declines for which no obvious cause has been determined.

Section IV. The petition lists oil and gas leases as a threat. Oil and gas leases are quite unlikely to ever be developed. Leases per se are not impacting.

Re East Mesa, most existing sand and gravel permits occur in low or (primarily) no value FTHL habitat.

Re Ogilby South, it is unclear what area is referred to in the petition. No plans exist to put in developments at Ogilby as referred to in the Recreation Activity Management Plan (RAMP). If the area is actually Gray's Well, the RAMP was specifically modified to prohibit camping as a FTHL mitigation. Regardless, facilities will not determine the amount of visitor use; this is determined by OHV riding opportunities.

Re Superstition Mountain, the area has been designated as an ACEC. A route of travel approval process is currently being carried out, and a race course will be officially designated in the future to reduce OHV impacts.

Section V. Re near Ogilby and south ..., the Algodones Dunes HMP was finalized in 1987.

Re status in East Mesa, BLM conducted monitoring in 1987 and 1988. Data indicate that the trend was stable in 1987 in western East Mesa (the only portion studied in 1987). The trend in the same general area was stable to decreasing in 1988. Decreases in southeastern East Mesa are likely to continue due to habitat loss. Four additional sections of high, one section of medium, and two sections of low value habitat were defined in 1988.

Re Yuha Basin, overall decreases appear to have continued, based on monitoring in 1987 and 1988. Cross-country vehicle use by U.S. Border Patrol is an increasing impact.

Re Superstition Mountain, FTHL relative abundance appears stable overall, although some decreases occurred in 1987. Additional surveys in 1987 and 1988 have defined 10 sections of high, 5 sections of medium, and 10 sections of low FTHL relative abundance.

Habitat values are defined as:
High = > 9 scat observed/hour effort, or 1 lizard observed.
Medium = 5 to ≤ 9 scat observed/hour effort
Low = 1 to < 5 scat observed/hour effort
Poor/Unoccupied = < 1 scat observed/hour effort.

Section IX. The proposed Navy withdrawal was modified as reflected in Table 1 (attached). Alternative E was the final decision. Changes to Class L rather than Class I were based primarily on FTHL values.

Re Yuha Basin ACEC, the ACEC boundary expansion was approved. There has been no oil and gas or geothermal development.

Re East Mesa, oil and gas exploration and/or development is highly unlikely.

Table 1. The OHV use areas do not correspond to geographic identifiers used by BLM; it is therefore difficult to understand how 1986 values were calculated in relation to 1981 acreages. For example, East Mesa is not an open area - authorized or unauthorized. Neither is Yuha Basin. Superstition Mountain is now primarily Class L.

Reserves. Reserves are proposed in BLM's draft FTHL management strategy document. However, the boundaries proposed in the listing petition are unrealistic and do not take into consideration current resource allocations arrived at through extensive public input. The proposed Superstition Mountain reserve area, for example, includes a large portion of Class I area. East Mesa includes much of the existing geothermal field. Yuha includes areas well outside even historically crucial habitat defined in 1979. We do not support such broad-brushed delineations. Since reserves would be likely to preclude incompatible uses, careful consideration must be given to resources present as well as current resource allocations (both retrievable and irretrievable) before reserves are delineated.

This constitutes El Centro's comments on the petition. If you have any questions, please contact Lillian Andris-Olech at FTS 895-6616.

G. Ben Koski

TABLE 1

BLM/Navy Cooperative Agreement: Summary of Changes in Multiple Use Class and Vehicle Access Designations

	ALTERNATIVE				
	A	B	C	D	E
	Proposed Action	No Action	Maximum Use	Minimum Use	Multiple Resource
MULTIPLE USE CLASS CHANGES (Acres) - WEST SIDE					
Unclassified to I	27,780	0	48,260	8,000	13,290
Unclassified to L	40,740	0	20,260	60,520	56,110
M to L	3,920	0	3,920	4,710	3,920
M to I	1,120	0	1,120	330	1,120
I to L	500	0	0	500	500
I to Unclassified	1,280	0	1,280	1,280	1,280
M to Unclassified	1,540	0	1,540	1,540	1,540
VEHICLE ACCESS CHANGES (Acres) - WEST SIDE					
Undesignated to Limited	40,740	0	20,260	60,520	56,110
Open to Limited	500	0	0	500	500
Undesignated to Open	27,780	0	48,260	8,000	12,650
Open to Undesignated	1,280	0	1,280	1,280	1,280
Limited to Open	1,120	0	1,120	330	1,120
Limited to Undesignated	1,540	0	1,540	1,540	1,540
Withdrawn, managed as Open	240	0	1,320	70	1,320
MULTIPLE USE CLASS CHANGES (Acres) - EAST SIDE					
L to Unclassified	5,370	0	5,370	5,370	5,370
M to Unclassified	5,800	0	5,800	5,640	5,640
M to L	10,230	0	0	10,390	10,390
VEHICLE ACCESS CHANGES (Acres) - EAST SIDE					
Limited to Undesignated	9,400	0	9,400	9,240	9,240
Closed to Undesignated	1,760	0	1,760	1,760	1,760
Limited to Closed	10,230	0	0	10,360	10,360

APPENDIX C - SURVEY METHODOLOGY

General Relative Abundance

The following technique will be used to determine general habitat values in terms of relative abundance per section surveyed.

Field Methods

Each 640 acre area (section) shall be surveyed by walking a triangular route. The triangle shall consist of sides measuring 0.9, 0.8, and 0.8 miles. Transect routes shall be recorded on 7.5 minute topographic maps, along with the compass bearing and length of each segment of the triangle. No part of the transect shall be closer than 0.05 mile to a section boundary. Transect width shall be 50 inches. Transects shall be performed by one investigator[1]. Each transect shall be walked in approximately 1 hour.

Data recorded include number and location along the transect of all FTHL scat and FTHLs. Sex and snout-vent length of all FTHLs observed are also recorded. The beginning and ending times, plus any block of time not spent actually performing the transect (e.g., measuring lizards, resting, etc.) shall also be recorded and shall be subtracted from the total time spent on the transect. A sample data sheet is presented in Figure 6.

Data Analysis

The total number of FTHL scat and FTHLs observed shall be standardized on an investigator-hour basis by the formula:

Scat/hour = [(Total Scat Observed)÷(Number of 15 minute increments)] x 4

A 15 minute increment is 15 minutes of transect walking time, or any fraction of this ≥ 8 minutes, excluding non-performance times.

For example, for 10 scat observed by one investigator in 68 minutes:

scat/hour = [10÷5] x 4 = 8 scat/hour,

while for 10 scat observed by two investigators each spending 68 minutes:

scat/hour = [10÷10] x 4 = 4 scat/hour.

Lizards observed per investigator hour are calculated similarly:

---

[1] If more than one investigator performs a transect, investigators shall walk parallel, non-overlapping routes.

FTHL/hour = [(Total FTHLs Observed)÷(Number of 15 minute increments)] x 4.

Survey results are qualitatively summarized as follows:

High relative abundance = >9 scat observed/hour effort or 1 lizard observed

Medium relative abundance = 5 to ≤9 scat observed/hour effort

Low relative abundance = 1 to <5 scat observed/hour effort

Poor relative abundance or unoccupied habitat = <1 scat observed/hour effort.

Intensive Surveys

Intensive surveys shall be performed in sections in which specific projects are proposed. Intensive surveys provide more detailed information on FTHL distribution within a section. They can be used in project planning where facility relocation is possible, and as baseline data gathering and monitoring tools to assess direct and indirect project impacts.

Field Methods

Each 640 acre area (section) shall be surveyed by walking 10 1-mile long parallel (north-south, or east-west) belt transects spaced 0.1 mile apart. Transect beginning and ending points shall be marked with blue lath, upon which the section and transect number are written, before transects are walked. Each 0.1 mile increment along each transect shall also be marked and labeled. This allows accurate plotting of the transect route. Location of the transect shall be marked on 7.5 minute topographic maps. The outside two transects will be 0.05 mile from the section boundaries. Transect width shall be 50 inches. Each transect shall be performed by one investigator. Each 1-mile long transect shall be walked in approximately 30 minutes.

Data recorded for each 1-mile long transect shall be as for general relative abundance surveys. A sample data sheet is presented in Figure 7.

Data Analysis

Data shall be standardized on a scat or FTHLs observed per investigator hour basis in 40-acre blocks. The same formulae shall be used as outlined for general relative abundance surveys, using total number of scat or FTHLs observed in each 40-acre block, and total number of 15 minute increments expended in each 40-acre block. Scat or FTHLs on the boundary of two 40-acre blocks are considered to occur in both blocks; thus, half of the common scat or lizards are assigned to each block. Time expended on transects forming a common boundary of two blocks is also divided equally between the two blocks. The resultant data are converted to relative abundance of High, Medium, Low, or Poor/Unoccupied as above, for each 40-acre block.

General Caveats

Field Season

Since FTHL activity levels vary with temperature, surveys must be performed when FTHLs are optimally active in order for survey results to be valid and comparable across years. BLM in California has standard calibration transects which are performed several times annually to determine when FTHL activity is within optimal levels. Surveys in California will not be considered valid or acceptable unless carried out within the Bureau-approved field season.

Field Conditions

FTHL scat are extremely fragile, and therefore highly susceptible to damage or dissipation by high wind and rainfall. Surveys shall therefore not be performed until 5 days of calm conditions have occurred.

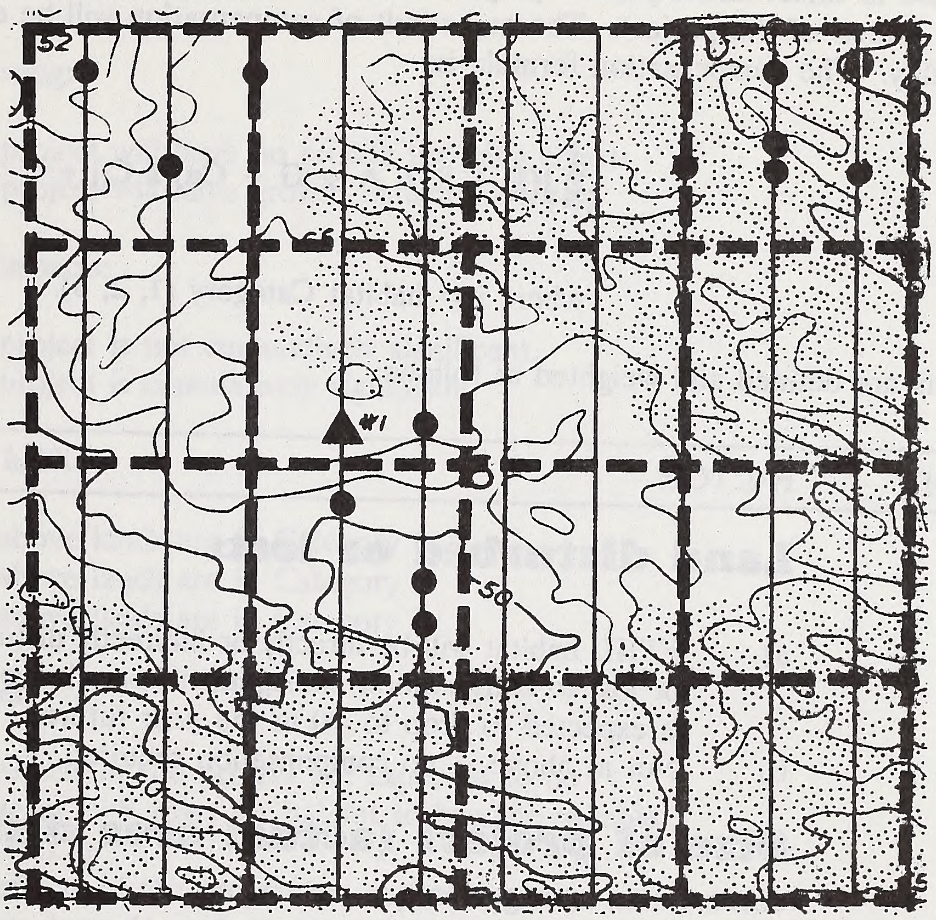
APPENDIX D - COMPENSATION FORMULA

time spent = 7.5 + 7.5 + .5(7.5) = 18.75 minutes
= 1.25 intervals

scat observed = .5 + 3 + 2 = 5.5 scat

$$\text{scat/hour} = \frac{5.5}{1.25} \times 4 = 17.6 = \text{High relative abundance}$$

T *16S* R *17E* sec. *5* Meridian *SB*



LEGEND

● = scat

▲ = FTHL

— = transect line

⌜⌟ = 40 acre block

Transect number	1	2	3	4	5	6	7	8	9	10
Direction walked	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓
Date	6/10/88	6/10/88	6/10/88	6/10/88	6/10/88	6/10/88	6/11/88	6/11/88	6/11/88	6/11/88
Investigator	FN	FN	FN	FN	FN	FN	FN	FN	FN	FN
Total scat/lizards	1/0	1/0	1/0	1/1	3/0	0/0	0/0	1/0	3/0	2/0
Time begin	0600	0635	0710	0750	0825	0900	0615	0650	0725	0810
Time end	0630	0705	0740	0820	0855	0930	0645	0720	0755	0840
Total time (note and subtract non-performance times)	30(0)	30(0)	30(0)	30(0)	30(0)	30(0)	30(0)	30(0)	30(0)	30(0)

FTHL OBSERVATIONS

Lizard number	Transect	Location	SnV length	Sex	Remarks
1	4	.45 mi	68 mm	F	—

The following formula is designed to produce a factor which multiplies the number of acres of habitat affected by a proposed activity. This factor is then multiplied by the average cost per acre[1] of FTHL habitat. Funds are to be collected in a "kitty" to be used for studies, habitat enhancement, or (in rare cases) land acquisition. BLM, U.S. Fish and Wildlife Service, and California Department of Fish and Game will determine fund allocation. The formula is designed to offset direct present project-related losses, and direct and indirect losses due to the future effects of the project. The end result of compensation will be enhanced management capability. The compensation formula is:

$$\sum_{i=1}^{3}[(L + S + A + G + Cu) \times C_i] \div T$$

where i = habitat Category (1, 2, 3).

Factors are defined and weighted as follows:

CODE	FACTOR	VALUE
L	**Land disturbed or lost:**	
	a) FTHL habitat will be directly or indirectly disturbed or lost to conservation management, or relative abundance is expected to drop to ≈0 in the near future.	1.0
	b) Not as above – no compensation required.	–-
S	**Size of project (actual area disturbed or lost to** conservation management):	
	a) The project is <2 acres in size.	0.5
	b) The project is ≥2 acres in size.	2.0
A	**Additional impacts on adjacent or other lands:**	
	a) Adjacent lands will not be affected.	0.0
	b) Adjacent or other lands will receive additional direct or indirect impacts which will reduce FTHL relative abundance. Impacts will be assigned values of 1 (low), 2 (medium), or 3 (high).	1.0-3.0

---

[1] Currently $150.00 per acre. Cost will be adjusted in future based on the Consumer Price Index and trends in desert land values.

CODE	FACTOR	VALUE
G	**Growth inducing:**	
	a) The project will have no growth inducing effects.	0.0
	b) The project will have growth inducing effects.	1.0
Cu	**Cumulative impacts:**	
	a) The project is not cumulatively significant.	0.0
	b) The project is cumulatively significant.	1.0
C	**Category of habitat:**	
	a) The above lands are in Category 1.	2.0
	b) The above lands are in Category 2.	1.75
	c) The above lands are in Category 3.	1.5
T	**Term of effect:**	
	a) The effects of the project are expected to be long term (>5 years for habitat to become useable for FTHLs).	1.0
	b) The effects of the project are expected to be medium term (1 to 5 years).	2.0
	c) The effects of the project are expected to be short term (<1 year).	3.0

For example, for a proposed 2 acre well pad to be constructed off of an existing road, within Category 3 habitat:

L = 1 (habitat will be directly disturbed)
S = 2 (project is ≥2 acres in size)
A = 0 (adjacent lands not likely to receive additional impacts)
G = 0 (the construction of an additional well pad is not likely to induce additional growth)
Cu = 0 (not cumulatively significant)
C = 1.5 (lands are in Category 3 habitat)
T = 1 (well pad will not be useable habitat unless the project is abandoned and the area is actively rehabilitated; since this is not likely, this falls into the >5 year category)

Calculating the formula:

$$[(1+2+0+0+0+) \times 1.5] \div 1 = 4.5$$

Therefore, compensation for this project would be 4.5 x 2($150.00) = $1350.00.

APPENDIX E - LITERATURE CITED

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